State of New York
Office of the State Comptroller
Division of Management Audit

PORT AUTHORITY OF NEW YORK AND NEW JERSEY

ADMINISTRATION OF CHANGE ORDERS FOR CAPITAL PROGRAMS

REPORT 96-S-54

H. Carl McCall

Comptroller

State of New York
Office of the State Comptroller

Division of Management Audit

Report 96-S-54

Mr. Lewis M. Eisenberg
Chairman
Port Authority of New York and New Jersey
One World Trade Center
New York, NY 10048

Dear Mr. Eisenberg:

The following is our report on the Port Authority of New York and New Jersey administration of change orders for capital programs.

We did this audit according to the State Comptroller's authority as stated in Section 7071 of the Unconsolidated Laws of New York. We list major contributors to this report in Appendix A.

Office of the State Comptroller
Division of Management Audit

January 29, 1998

Executive Summary

Port Authority Of New York And New Jersey Administration Of Change Orders For Capital Programs

Scope of Audit

A change order, also known as an additional work order or an extra work order, authorizes a contractor to add or delete work because of unanticipated field conditions or changes in design or project specifications. Management should minimize the use of change orders because the cost of change order work is usually negotiated with an individual contractor instead of derived through competitive bidding. If a lump sum price cannot be negotiated, change order charges are often made on a time-and-material basis. Prior to 1995, the Authority's goal was to limit change order work to 10 percent of a contract's original base amount.

Our objective was to assess how effectively the Port Authority of New York and New Jersey (Authority) monitors its process for issuing change orders. We also determined if the Authority issued change orders that could have been avoided with proper planning, and if change orders were issued only for work which was related to the original contracts. To achieve our objective, we reviewed a judgmental sample of 30 change orders from projects at the Newark and JFK airports.

Our audit addressed the following questions about the Authority's administration of the change orders for the period of January 1992 through April, 1997:

- Has the Authority effectively managed construction projects to minimize the costs and amount of change orders issued?
- Did the Authority officials approve change orders timely?

Audit Observations and Conclusions

According to a recent study by an Authority consultant, the Authority limited change order costs, on average, to 10 percent or less of total construction contract costs, which was consistent with the Authority's prescribed goal. However, we conclude that the Authority has not taken sufficient actions to minimize the number of change orders issued for larger capital projects - those of $5 million or more. Thus, there is a high risk that change-order costs are higher than necessary for large projects. Specifically, we noted that officials issued large numbers of change orders for several larger projects; that change orders and supplemental agreements were used instead of competitive bids; and that the approval processing time for some change orders was excessive. The need for many higher-value change orders could have been avoided if Authority officials planned and designed certain projects better.

As noted previously, the Authority's goal was to limit change order work to 10 percent of the contract award. However, our review of 26 contracts of more than $4 million each revealed that 1,269 change orders (totaling about $37 million) were issued from January 1992 through February 1997. Aggregately, these change orders amounted to nearly 14 percent of the original contract amounts. Because of change orders, one contract had a cost overrun of $13 million, and another an overrun of $7.5 million. Also, the Authority issued ten change orders, totaling about $3.2 million, to pay for design changes because the Design Division omitted some obvious design items before the contracts were awarded. As a result, construction projects were delayed and the Authority incurred millions of dollars of additional costs. (See pp.5-7)

Authority construction guidelines state that, "No work can be performed under a contract, even as extra work, which is not . . . within the scope of the contract." However, the Authority awarded firms millions of dollars of work, that was outside the scope of contracts, by issuing change orders and supplemental agreements. This occurred because the Authority does not require bidding for construction work above a certain dollar amount. As a result, projects were delayed and the Authority may have paid higher prices for work. (See pp.13-15)

Officials sometimes took too long to approve change orders. It took an average of 83 days to approve the Post Award Contract Change (PACC) forms for 26 change orders we reviewed. Further, some change order work was actually done before the PACC was approved, making that approval process perfunctory. (See pp.17-18)

Officials need to ensure that data on the Authority's automated capital project monitoring system (CAPTRAK) is accurate. CAPTRAK sometimes significantly understated actual total costs because certain internal Authority costs were not charged to appropriate project codes. Also, because CAPTRAK routinely indicated that actual costs for closed projects were significantly less than the authorized budget amounts, management could be mislead that capital programs were administered better than they actually were. (See pp.19-23)

Comments of Authority Officials

We provided Authority officials with draft copies of this report for their review and formal comment. Authority officials disagree with many of our report's observations and conclusions. They also suggested that many of our recommendations reflected practices that were already in place at the time of our audit fieldwork. Nonetheless, we maintain that our observations and conclusions are accurate and that Authority management needs to strengthen procedures to minimize the need for change orders for the Authority's multi-million dollar construction projects.

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Introduction

Background

In 1995, as part of a $4 billion multi-year capital program, the Port Authority of New York and New Jersey (Authority) spent about $750 million to expand facilities and improve the infrastructure and industrial development of the metropolitan region. Management will spend nearly half of the $4 billion on the Authority's three airports - Newark, LaGuardia, and Kennedy. In 1994 and 1993, capital expenditures totaled $688 million and $584 million, respectively. These amounts include Authority staff costs, administrative costs and contract payments for contracts approved in previous years.

A change order, also known as an additional work order or an extra work order, authorizes a contractor to add or delete work because of unanticipated field conditions or changes in design or project specifications. Change orders may be initiated by the Authority or the contractor. Change orders should be kept to a minimum, however, because the prices for change order work are usually determined through negotiated agreements with contractors rather than competitive bidding. If the agency and contractor cannot agree on a total price for change order work, payments often will be made on a time-and-material basis. Under this method, the agency pays the contractors for the hours employees work and for materials used, plus an overhead and profit factor. Consequently, there is significant risk that work performed through a change order will be more costly than if it had been competitively bid.

Before a change order form can be approved, Authority officials have to prepare a Post Award Contract Change (PACC) form. Depending on the amount of estimated cost, various officials are authorized to approve a PACC form. After a PACC is approved, a change order form is prepared by a resident engineer who is allowed to approve a change order up to $10,000. A construction engineer may approve a change order up to $25,000. A manager of construction is required to approve a change order between $25,000 and $50,000, and a chief engineer approves change orders over $50,000.

The use of many high-cost change orders may indicate inadequate initial planning by the agency and/or inadequate supervision of contractors' work. During our audit period, it was the Authority's goal to limit the value of extra work to 10 percent of the contract award. In 1995, as a result of an independent consultant's review of Authority construction contracts, the Authority's Board of Commissioners (Board) requested that the extra work provision on contracts be reduced from 10 percent to 8 percent. The Board also asked that the provision be further reduced to 6 percent in 1996, except for the limit on extra work for construction contracts of buildings, which would remain at a maximum of 8 percent.

From 1993 through 1996, the Authority closed-out 663 construction contracts worth about $1.2 billion. During the same period, Authority engineers issued 4,002 change orders, mostly on the larger contracts. Contracts of $1 million or more accounted for 2,908 of the 4,002 change orders authorized. One hundred fifty eight contracts (23.8 percent of the 663) represented more than 88 percent of the total value of the contracts closed during the period.

Audit Scope, Objectives and Methodology

Our audit objective was to assess how effectively the Port Authority monitors its process for issuing and approving change orders for the period of January 1992 through April 1997. We also assessed whether or not the Authority issued change orders that could have been avoided with proper planning or design, and that change orders were only issued for work which was related to the original contract.

To achieve our objective, we selected a judgmental sample of change orders. From lists of projects over $5 million and contracts provided by PA officials, we selected 30 change orders from 10 contracts for construction at the Newark and JFK airports (see Exhibit A). The change orders we selected were worth about $11 million. We also interviewed Authority officials, reviewed appropriate files, obtained and analyzed related project and contract reports, and visited project field sites.

We did our audit according to generally accepted government auditing standards. Such standards require us to plan and do our audit to adequately assess those Authority operations included in our audit scope. Further, these standards require us to understand the Authority's internal control structure and its compliance with those laws, rules and regulations that are relevant to the operations included in our audit scope. An audit includes examining, on a test basis, evidence supporting transactions recorded in the accounting and operating records and applying such other auditing procedures as we consider necessary in the circumstances. An audit also includes assessing the estimates, judgments, and decisions made by management. We believe our audit provides a reasonable basis for our findings, conclusions and recommendations.

We use a risk-based approach when selecting activities to be audited. This approach focuses our efforts on those operations identified through our preliminary survey as having the greatest probability for needing improvement. Consequently, by design, finite audit resources are used to identify where and how improvements can be made. Thus, we devote little effort to reviewing operations that may be relatively efficient or effective. As a result, our audit reports are prepared on an "exception basis." This report, therefore, highlights those areas needing improvement and does not address activities that may be functioning properly.

In responding to our draft report, Authority officials claim that the 30 change orders (totaling about $11 million) we reviewed in detail represented a small proportion of Authority's total capital spending, and therefore, are not representative of the Authority's processes and procedures. However, our overall conclusions were not based solely on our detailed review of the 30 change orders. As indicated previously, the Authority issued 4,002 change orders from 1993 through 1996 on closed-out contracts of $1 million or more. As noted on pages 5 and 6 of the report, these change orders cost several tens of millions of dollars for a small number of contracts and exceeded the 10 percent limit. However, we believe the results of our other analyses demonstrate that the Authority did not always limit change orders on its major capital projects. Examples include lengthy delays in the approval of post award contract changes (PACCs), allowing construction work to start prior to approval and not properly reviewing a contractor's financial position, which resulted in increased costs when the contractor breached the contract.

Authority officials also stated that extra work expenditures amounted to 6.7 percent of the 247 contracts (valued at $132 million) that were awarded and closed out after January 1994. We believe this is misleading. These contracts averaged only $534,000, and thus, were much smaller than the contracts we reviewed. We would also note that the Authority's processes inherently preclude larger and more complex projects, which have much greater risks for change orders, from being closed-out. As noted subsequently in this report, the Authority frequently does not close-out projects which are essentially complete. A more meaningful analysis would have included the change order costs for the projects which have not been closed-out.

Comments of Authority Officials

We provided draft copies of this report to Authority officials for their review and formal comment. We considered their comments in preparing this report and are included as Appendix B. Authority officials also included the Engineering/Architecture Design Division Quality Control Plan (May 1993) as an attachment to their response. We did not append this document to our report. However, it is retained on file within the State Comptroller's Division of Management Audit and State Financial Services.

Authority officials disagree with many of our report's observations and conclusions. They also suggested that many of our recommendations reflected practices that were already in place at the time of our audit fieldwork. Nonetheless, we maintain that our observations and conclusions are accurate and that Authority management needs to strengthen procedures to minimize the need for change orders for the Authority's multi-million dollar construction projects.

Within 90 days after final release of this report, we request the Executive Director of the Port Authority of New York and New Jersey to report to the Governor, the State Comptroller, and the leaders of the Legislature and fiscal committees, advising what steps were taken to implement the recommendations contained herein, and where recommendations were not implemented, the reasons therefor.

Frequency and Costs of Change Orders

A consultant's study indicated that the Authority, on average, limited change orders to the 10 percent allocated by most contracts. However, we found that the Authority often issued large numbers of change orders for contracts of several million dollars or more. This occurred because the Authority did not consistently follow its own policy and limit the dollar value of change orders issued for certain contracts. As a result, hundreds of change orders have been issued against some contracts that have cost the Authority millions of dollars more than the standard 10 percent authorized for extra work.

The Authority did not have adequate controls to limit the growth of change orders, both in the number issued and cost. As a result, change orders at Newark airport were frequent and costly. For example, we analyzed contract and change order data covering the period when the Authority undertook installation of the Automated People Mover and the International Terminal projects through February 1997. Our analysis showed that the Authority issued 1,269 change orders totaling about $37 million on 26 construction contracts. Aggregately, these change orders represented nearly 14 percent of the original contract amounts and, therefore, exceeded the Authority's 10 percent goal for extra work (change orders). We noted that 14 of the 26 contracts exceeded the 10 percent goal. Extra work for 6 of those 14 contracts exceeded 20 percent of the original contract amounts. For example, the Authority authorized extra work costing 24 percent of the original value of contract EWR 124.016. Extra work for contract EWR 124.036A equaled 39 percent of that contract's original amount.

(Note: In responding to the draft report, Authority officials stated that the change orders were not only for extra work, but also included supplemental work and breach recovery work. Officials further stated that the report fails to recognize the difference between extra work, supplemental work, and breach recovery work. We would note, however, that Authority officials did not distinguish extra work from supplemental work or breach recovery work. Moreover, irrespective of any distinctions, change orders were required to have work performed. The Authority's sub-categorization of change orders was not relevant to our assessment of the justifications for the change orders.)

Four of the five selected contracts related to these two projects have been completed, and the other is nearly finished. One of the completed contracts (EWR 124.015) was originally approved for $9.6 million (a base amount of $8.7 million plus about $900,000 for extra work). Another completed contract (EWR 124.017) was originally approved for $16.4 million (a base amount of $14.9 million plus $1.5 million for extra work). However, the total

amounts paid to the contractors, through February 1997, were $13.9 million and $29.5 million. These amounts represented overruns of $4.3 million (45 percent) and $13.1 million (80 percent), respectively. Moreover, the costs of the extra work equaled almost 50 percent of the base amount for EWR 124.015 and 88 percent of the base amount for EWR 124.017. We attribute the overruns, at least in part, to the fact that the two contracts had 241 and 335 change orders, respectively.

Authority officials attribute the use of change orders for EWR 124.015 and EWR 124.017 primarily to the defaults of the general contractors who preceded the contractors that completed the work authorized under the two contracts. Specifically, they stated that more than half of the change order costs represented payments to subcontractors who replaced the prime contractors that breached their contracts. All PACCs for these change orders indicated that the Authority expected to recover the costs from the breached contractors. However, the Authority did not recover any funds from the prime contractors in question because the contractors did not have any assets.

We note, however, that one major project that was not impacted by the general contractor default, (EWR 174.048) had 350 change orders totaling $7.5 million. These change orders increased the aggregate value of the base contracts by 17 percent. Another example was contract EWR 124.016. The original authorized extra work allocation was 10 percent of the base amount when the contract was awarded. However, the Authority officials subsequently increased the authorized extra work twice and the final authorized extra work for this contract amounted to 24 percent of the base amount. Authority officials indicated that a reason why some of these contracts had a large amount of change orders was that the construction often took place in existing operating facilities, as opposed to construction of a new facility. We acknowledge that construction in facilities which are already operational would tend to be more complicated than construction of a new facility (or a facility with little or no ongoing activity). Nevertheless, we believe that management has the ability and responsibility to ensure that appropriate design and planning takes place to facilitate construction work in an operational facility while standard daily activities continue.

Before a responsive low bidder is awarded a contract, the Port Authority determines whether the contractor has the technical and financial ability to perform the job for which it has bid. Authority staff verify the sufficiency of a bidder's working capital by analyzing data from its latest audited financial statements. The Authority also confirms bank accounts and contacts financial reporting services to assess a contractor's financial standing. Based on the results of these steps, officials determine if a performance bond will be necessary. If the contractor is unable to perform satisfactorily, a performance

bond will shield the Authority from additional expense. In financial reviews of a bidder, performed after November 1, 1993, the Authority confirmed the authenticity of the bid bond submitted by the low bidder.

However, we found evidence in one contractor's file that the financial review was not performed properly. In fact, this contractor did not have sufficient resources to pay subcontractors, and breached its contract with the Authority. As a result, the Authority incurred significant amounts of extra costs for the project (EWR 124.015). Specifically, we found no evidence that officials verified that the successful bidder had sufficient net working capital (total current assets less total current liabilities). Although documents in the file noted that the contractor had adequate working capital to perform the work, our own calculation showed otherwise.

Our calculation indicated that the contractor's current liabilities ($850,106) exceeded its current assets ($724,011) by $126,095. A firm's current assets should exceed its current liabilities to provide evidence of the firm's ability to pay its short-term debts, including amounts owed to subcontractors. In addition, the contractor's average payments were slower than the industry average. Dun and Bradstreet's credit rating for the contractor was "B" (moderate risk). Thus, we concluded that the Authority could not be adequately assured that the contractor's financial position was sufficient enough to fulfill the contract obligations.

According to Authority officials, they believed the contractor had sufficient working capital because the contractor's financial statements reported amounts due from affiliates and shareholders totaling about $463,000. Subsequently, the Authority required a performance bond from the contractor because the contractor had not previously worked for the Authority. When this contractor performed work on one of the Authority's major projects, he was unable to pay certain subcontractors. Later, the contractor breached the contract when unpaid subcontractors discontinued work. Further, when a subcontractor sued against the performance bond, the Authority found that the bond instrument was falsified.

In responding to the draft report, Authority officials indicated that controls over change orders were adequate because "... in every instance, proper authorization is obtained before a change order is issued." This is not true. As detailed subsequently in this report, Authority officials did not approve change order approval forms for 3 of 29 change orders we reviewed. Also, for 9 other change orders (of the 29 we reviewed), Authority officials formally approved the change order forms after contractors began the corresponding work.

Recommendations

1. Ensure that goals to limit the dollar value of change orders issued against contracts are met. Consider establishing a formal policy to limit subsequent additional extra work after contracts are awarded.

2. Award contracts only to contractors who are financially qualified to perform the job.

Incomplete Project Designs and Scope Changes

According to Authority officials, the high rates of change orders (and associated costs) for the contracts we reviewed can be attributed, at least in part, to the high levels of program activity that existed at the sites (airports) prior to the onset of construction. To minimize negative impacts on operations, it is reasonable to expect management to have to negotiate some change orders. Officials also stated that because construction was taking place at sites with pre-existing facilities (as opposed to locations with no pre-existing facilities), this increased the chance that contractors would encounter unforeseen problems in performing their work. Although these represent reasonable explanations for some of the change orders we reviewed, we concluded that management should have been able to avoid other costly change orders.

We found that 9 of the 30 change orders we reviewed occurred because the original designs were incomplete and two were needed because the Authority had not planned adequately. Specifically, the Design Division omitted obvious and necessary design specifications and details prior to awarding contracts. Also, the Authority allowed numerous design and scope changes after the contract was awarded. As a result, construction projects were delayed and the Authority incurred millions of dollars in additional costs.

The Design Division is responsible for approving, and sometimes for developing architectural designs before construction starts. It is also responsible for verifying design accuracy and structural integrity to ensure that design drawings include no significant safety problems. The Design Division also conducts a formal quality control program to audit completed work performed by outside consultants.

From our judgmental sample of 30 change orders, we identified 9 change orders (totaling about $3.2 million) that were issued because project designs were incomplete when the contracts were awarded. Sometimes incomplete designs resulted from poor oversight or program decisions that were made too late in the design process. Authority officials justified the extensive use of change orders for one of the contractors in our sample knowing that the bid amount was significantly less than the amount approved by the Authority's Board for associated projects.

Examples of change orders that were issued because of design changes include the following:

- The Authority approved a change order (EWR 124.016, C.O. #10) for $750,000 to revise certain structural steel sections. According to Authority officials, funds could be saved by getting the project started quickly, even though more design costs would be incurred later for design and scope changes. However, there was nothing to document how the extra design costs would be more than offset by savings achieved by getting the project started early. Also, officials stated that the Authority could afford the $750,000 change order because the total amount of the contract bids for this project was $8 million lower than the total cost estimate.

  The PACC form for this change order indicated that the project's architectural drawings did not adequately correspond with certain structural drawings. Although the Engineering Department changed the design of certain steel structures to make them consistent with the architectural drawings, the amended drawings were not released to the contractor timely because the Line Department had not authorized the Engineering Department to proceed with this change. As a result, construction was delayed for 212 days, and the Authority had to pay an additional $356,000 to the contractor for the delay.

- The Authority awarded a contractor $21.2 million to build remote stations (stations in parking lots to board the monorail). In January 1995, the contractor received a change order (EWR 124.016, C.O. #28) for almost $307,000 to provide structural support and anchoring details for vertical drops needed to support heating, ventilation and air-condition ducts. This change order was needed because the original contract design did not address the method to support the ducts. As a result, construction was delayed for 107 days, and the Authority incurred a total cost (including costs for delays) of $519,000 for this change order.

  According to Authority officials, the Division's primary concern is safety. Consequently, officials considered minor imperfections in items and details that did not jeopardize safety to be acceptable. They consider the use of change orders to make refinements identified during mock-ups or during the shop drawing phase of a contract to be an acceptable practice. One Division official told us that his department works under a tight schedule and expects that change orders will be needed to remedy imperfections in design during the construction stage.

- The Authority awarded a contractor a change order (EWR 174.048, C.O. #30) worth $349,000, in November 1995, to revise signs in

International Terminal B. This change order was required because certain specifications for signs were omitted from the final bid document. Specifically, an Engineering Department official told us that the Line Department had not submitted its sign specifications at the time the contract was awarded. The project manager of the Aviation Department indicated that by the time his Director decided to have multi-lingual signs at the airport, it was too late to change the original contract design. The project manager added that construction would have been delayed for several months if the Engineering Department elected to wait for this design change to be incorporated in the original contract. He also agreed that the $349,000 cost for this change order could have been avoided if the decision to use multilingual signage was made earlier.

- The Authority approved two change orders (JFK 584.002, C.O. #20 and C.O. #21) to correct design flaws that had been identified before construction started. Specifically, C.O. #20 was needed to correct design flaws in canopy columns. C.O. #21 was needed to correct imperfections in the reveal space and vents in the frontage canopy. These change orders became necessary when engineers determined, during reviews of shop drawings, that access to electrical junction boxes was inadequate. Engineers further determined that a planned beam covering was insufficient. Nevertheless, the Authority allowed construction to proceed, despite these design problems, because the problems could be corrected later through change orders. These two change orders cost about $293,000.

- The Authority awarded a contractor a change order for $297,000 to erect columns and beams for the guideways in Terminal Stations A, B, and C and in the courtyards between these stations at Newark Airport. The original contract stated that the work was to be performed during the day. However, after construction was underway, the Aviation Department requested the contractor to work in the early morning and evening on column and beam construction around busy airport roads. As a result, the Authority issued this change order to provide additional funding for the higher costs of evening labor. Again, had the Aviation Department communicated its concerns prior to contract award, this change order could have been avoided.

According to Authority officials, they often award contracts even though the related design work is incomplete. They further advised that it is industry practice to award contracts before minor design steps are completed or knowing that minor changes will be needed. We acknowledge that there may be benefits to awarding contracts prior to the completion of minor design

steps. However, we concluded that many change orders, for larger capital projects, resulted from significant design changes that could have been foreseen. Sometimes change orders occurred because of a lack of coordination among the different departments within the Authority. As a result, avoidable change orders often cost the Authority large amounts of dollars and significantly delayed project completion.

In responding to the draft report, Authority officials stated that they have a written quality control process which ensures that no obvious or critical design omissions are made. Nonetheless, we believe the problems previously detailed demonstrate that the Authority still needs to improve its project design and planning procedures, perhaps by ensuring that written quality control processes are consistently followed.

(Note: Based on the Authority's response to the draft report, we deleted comments regarding the electrical power distribution system for the monorail system at Newark Airport from this report.)

Recommendations

3. Ensure that design reviews are thorough enough to detect major problems with the design.

4. Coordinate activities of participating departments before contract awards are made to minimize the number of change orders during construction stage.

5. Minimize the number of design and scope changes by defining the scope of the project adequately before the contracting process is initiated.

Use of Change Orders and Supplemental Agreements

Vendor competition generally increases the likelihood of purchasing quality goods and services at favorable prices. Competition for purchases, usually by means of open competitive sealed bidding, is intended to secure sound value, to guard against favoritism and profiteering, and to promote the interests of private enterprise by providing equal opportunities to compete for business. In addition, according to the Authority's Construction Contract Guidelines, "No work can be performed under a contract, even as extra work, which is not encompassed within the general agreement under the contract, i.e.: within the scope of the contract."

However, the Authority awarded contractors millions of dollars for work that was outside the scope of the corresponding contracts by authorizing change orders and supplemental agreements instead of bidding the work competitively. This has happened, at least partially, because the Authority does not have a policy requiring construction work to be competitively bid if it exceeds a prescribed dollar amount. Moreover, this practice has delayed project completion, and the Authority could have missed opportunities to obtain services at more favorable prices. In certain instances, officials justified this approach by noting that a general contractor had defaulted on the project, thus making it necessary to award the work to a qualified company that was already a subcontractor on the job. However, Authority officials did not provide any formal analysis to demonstrate that the time saved by working outside the competitive bidding process exceeded the benefits of bidding the work competitively.

The following are some examples of supplemental agreements and change order work that could have been competitively bid:

- In December 1993, the Authority entered into a contract (174.048) for building International Terminal B at a cost of $44.5 million. In early 1995, the Authority issued a supplemental agreement to the same contractor in the amount of $1.9 million to build a control center in front of the new Terminal. In December 1995, the Authority issued a second supplemental agreement to this contractor, for work related to the first supplemental agreement, amount to $1.6 million. The work included in these two supplemental agreements was not part of the scope of the original contract. This contractor also received two other contracts, amounting to $14.8 million, to renovate existing buildings.

Authority officials told us that they awarded the additional contracts to this contractor because the control center would be used to monitor all of the electronics installed in the new international terminal. However, we believe that officials should have known that a control center was needed for the new terminal at the time the terminal was designed. Thus, the control center should have been included in the competitive bid for the new terminal or bid separately. In addition, the building renovation work should have been competitively bid, because it was outside the scope of the work for the new terminal.

- The Authority awarded a contractor $254,000 (for EWR 124.015) to construct walls, doors and ceilings at the Maintenance Control Facility. Subsequently, the Authority issued change orders totaling about $1.6 million to this contractor for additional work outside the scope of the contract. Authority officials indicated that, although the work was outside the scope of the contract, it was still within the scope of the project.

- A contractor performed out-of-scope work for the Authority at the same time it was executing contract JFK 584.001. According to the Authority's Memorandum of Justification, contract JFK 584.001 was for the third phase (RWCP #3) of the Roadways Project. According to a consultant's sketch, the RWCP #3 contract site was located in front of the British Airlines Terminal and adjacent to the American Airlines Terminal. However, Change Order #51 authorizes this contractor to revise curbing, parking, striping and signage in front of the TWA terminal. However, the RWCP #3 site and the TWA terminal are some distance apart. In addition, RWCP #5 is proposed for the same sites and is expected to include similar work. Also, RWCP #2, which included work in front of the same terminal, was completed in February 1995.

  The final cost of the out-of-scope work authorized by Change Order #51 was $15,000. However, this work also strengthened the contractor's position to claim extra compensation at the end of the contract. Authority officials advised us that they agreed to pay this contractor about $300,000 in extra compensation resulting from the out-of-scope work.

Authority officials told us that they awarded additional work that was outside the scope of their contracts, without performing formal cost benefit analysis, because the contractors were already conveniently located at the work site. However, we believe the Authority could have received more favorable prices, if the work had been competitively bid. In addition, such out-of-scope

work can also cause delays because it takes the contractor away from his primary contract work. For example, contract EWR 174.048 (for the new International Terminal B) was projected for completion on June 15, 1995. However, the terminal was actually completed on January 31, 1996 - about seven and one-half months behind schedule. Also, contract JFK 584.001 (the Roadways Project) was scheduled to be completed on April 29, 1994. However, it was actually completed in December 1995 - about 20 months behind schedule.

The Authority's new formal policy requires any extra work, outside the scope of the original contract, to be executed under a supplemental agreement. Furthermore, this policy requires the Engineering Department to solicit bids from at least three contractors that are working at Authority facilities and can perform the required work. However, for time-sensitive work or work for which three contractors are not already on site, the policy allows the Engineering Department to choose a contractor without any competition. Thus, we believe there continues to be high risk that the Authority will award contracts for out-of-scope work without using a competitive procurement process.

In responding to the draft report, Authority officials stated that out-of-scope work has been accomplished through supplemental agreements with contractors since 1995. Officials added that supplemental agreements typically are competitively bid by three or more active contractors. Although it may be impractical to formally competitively bid relatively minor supplemental agreement work, we believe that large supplemental agreement projects (those at or above a pre-established threshold for estimated cost) should always be competitively bid.

Recommendation

6. Competitively bid all capital project work (above a predetermined dollar amount) outside the scope of original contracts unless it can be clearly demonstrated that this process will result in a substantial increase in cost or project delay.

Authorization of Post Award Contract Changes (PACCs)

At the time construction contracts are awarded, a dollar allowance is authorized for extra work. However, to use this extra work allowance, Authority staff must prepare a PACC form and a change order. Generally, this process begins when a resident engineer determines that a change order is necessary and prepares a PACC. As stated previously, approvals must be obtained from various levels of management depending on the amount of the change order. Because the cost of extra work can be substantial, officials should conduct their reviews and issue their approvals timely, so that problems can be detected and prevented before construction begins. Further, PACCs should be processed timely to help minimize delays in project completion.

However, we determined that it sometimes took long periods of time to process and approve PACCs. Consequently, contractors have performed extra work without proper authorization. We attribute this problem to the Authority's lack of formal procedures to help ensure that PACCs are processed timely. The following summarizes the processing times of the 29 PACCs that correspond to the 30 change orders we sampled, as referenced earlier in this report. (Note: One PACC authorized two of the change orders we reviewed.)

Processing Times	Number of PACCs	Proposed Amount
Under 30 days	5	$1,125,740
30 to 59 days	10	3,107,677
60 to 90 days	3	823,423
Over 90 days	8	2,951,275
PACC not approved	3	945,000

As shown in the chart, Authority staff took over 90 days to process and approve 8 of the PACCs we reviewed. In one instance, for example, a resident engineer signed a PACC on February 10, 1994 for an extra work allowance of $445,000. However, the assistant chief engineer for construction did not approve the PACC until October 7, 1994, nearly 8 months after the PACC was prepared. Authority officials attributed the delay to line

department officials, who did not agree with the reason for the PACC and the cost estimate for the extra work.

In another instance, a resident engineer prepared a PACC for about $307,000 on May 5, 1994. This PACC was signed by the engineer of construction the same day. Over a year later, on June 9, 1995 the line department approved it. On June 23, 1995, the manager of the Construction Management Division approved the spending of the extra work allowance. As such, the Authority took more than 13 months to approve this PACC. Moreover, records indicate that the construction work for this PACC began in December, 1993, 18 months before the required approval was obtained. Not only had the contractor been working without an approved PACC; the contractor had been working for some five months before the PACC was originally prepared.

In all, contractors performed change order work for 9 of the 26 approved PACCs before the PACCs were approved. Thus, the Authority's PACC review and approval processes were sometimes perfunctory. Furthermore, in three other instances, change order work totaling $945,000 was performed without formal approval of the corresponding PACCs.

Officials told us that the Authority does not have a policy regarding the length of time allowed for officials to review and approve PACCs. It should be noted that the projected completion dates of two contracts (EWR 124.016 and EWR 124.015), related to several of the PACCs we reviewed, were delayed by 875 and 951 days, respectively. We believe that the delays in the review and approval of PACCs may have contributed to the delays in the completion of these projects.

In responding to the draft report, Authority officials stated that the 1994 Deloitte & Touche study indicated that the Authority processed PACCs timely when compared to other peer organizations. Nonetheless, we maintain that our observations and conclusions are accurate and demonstrate that management needs to strengthen the Authority's PACC approval procedures.

Recommendation

7. Develop procedures that specify time frames for the approval of PACCs to ensure that they are processed in a timely manner. Ensure that PACCs are approved before contractors begin change order work.

Management Information and Project Funding Allocations

It is imperative that a public agency, operating programs of the magnitude of those of the Authority, have automated management information systems that provide executive management with accurate, complete, and timely information to effectively plan and monitor the progress of major capital program initiatives. However, we conclude that the executive management generally did not receive complete, accurate and timely summary reports on the status of the Authority's capital construction programs. We also questioned the propriety of the amounts allocated for capital projects. We noted that Board-approved allocations generally exceeded, often significantly, the amounts actually needed to pay for projects. As a result, executive managers have limited ability to make the most informed decisions regarding capital program plans, policies and procedures. In turn, this limits the Authority's ability to ensure that capital program funds are spent in the most economic and efficient manner.

Management Information Systems

Different departments within the Authority maintain different databases on capital construction costs. The Engineering Department maintains the CONTRAK database system which tracks construction contract data, such as extra work costs, change orders, authorization dates of PACCs, contract awards and actual amounts spent. However, Authority officials informed us that the system is not used to produce the reports that are routinely submitted to the Board and upper management. Rather, the Engineering Department uses information from CONTRAK to produce monthly reports, such as the accrued liability for construction contracts, for the Authority's Comptroller Department. Such reports generally are not provided to executive management and the Board.

The Authority's Management Information Systems Department maintains a database, called "CAPTRAK," which tracks capital costs at the project level. Authority officials told us that they use CAPTRAK data to produce reports for the Board of Commissioners. Currently, because CAPTRAK and CONTRAK are not linked, the Authority cannot produce reports which include contract-level data associated with specific projects. When management needs data on contracts associated with a particular project, certain data may have to be compiled manually. Also, staff from the Engineering and Comptroller's Departments are required to enter internal data for "soft" costs (which include construction planning and engineering, general administration, and other related costs) to the appropriate CAPTRAK project codes, to accumulate total project costs. However, we concluded that all internal costs

are not routinely charged to projects through CAPTRAK. As a result, CAPTRAK reports may not accurately reflect total costs for particular projects.

Our initial review of CAPTRAK data files disclosed that the Authority had closed-out (designated as completed) only 8 of 170 projects listed. Subsequently, at our request, officials identified 34 additional projects that were completed, although CAPTRAK did not indicate so. As such, 42 (see Exhibit B) of the 170 projects listed were completed. We also found that the amounts spent on these projects, as indicated by CAPTRAK, may not be accurate. For example, according to the reports produced by a field consultant, the Authority spent $351 million on the Monorail project through July 1996. However, the CAPTRAK database indicated that $203.4 million was spent on that project through April 1997, a difference of $147.6 million.

In responding to the draft report, Authority officials indicated that they are initiating a project to replace their suite of financial management reporting systems. Officials further indicated that this project should provide greater reporting flexibility and improve timeliness. The project will also include an assessment of potential improvements in the quality and timeliness of CAPTRAK reports. However, officials also responded that it was not necessary to link CAPTRAK and CONTRAK to produce meaningful management reports.

Recommendation

8. Ensure that management information systems can provide executive management with accurate, complete, and timely information on the costs and status of capital projects. Consider linking CAPTRAK and CONTRAK and including data from computerized systems used by field consultants to produce meaningful management reports.

Project Funding Allocations and Reported Expenses

Management should strive to establish capital construction budgets which include accurate estimates of costs so that limited financial resources can be allocated appropriately. However, we found that the total authorized (budgeted) amounts ($1.04 billion) for the 42 completed projects exceeded the total actual expenditures ($659 million), as reported by CAPTRAK for those projects, by $384 million (about 37 percent of the total budgeted amount), as indicated by Exhibit B. From another perspective, the difference of $384 million equals 58 percent of the actual costs as reported by

CAPTRAK. As noted previously, CAPTRAK's apparent understatement of actual costs accounts for some of the difference, at least for certain projects.

Furthermore, according to Authority officials, amounts budgeted for several major, long-term projects were approved in the late 1980s, when inflation rates were higher than those of the early 1990s. As a result, there is a high risk that the amounts initially approved for these projects were excessive, because they were based on projected inflation rates that exceeded the actual inflation rates. However, although inflation rates declined considerably since the late 1980s, the Authority did not adjust the approved budget amounts downward. We analyzed the project level budgets related to the ten contracts (corresponding to six projects) in our sample and found the following:

Project Code	Amount of Approved Budget	Expenditures Per CAPTRAK	Actual No. of Contracts Reviewed	Amount of Contract Overruns	
CA43-002	$378,000,000	$203,388,948	4	$19,608,685	*
CA43-001	110,000,000	89,425,779	1	7,590,000	
CA32-006	409,001,371	217,610,943	2	21,566,000	
CA03-054	14,848,000	12,557,039	1	809,207	
CA03-079	24,329,000	18,929,515	1	11,871,500	*
CA32-004	68,448,000	46,884,234	1	418,114	*

* Projects have been completed.

Although there were contract overruns (caused by change orders and other factors) for each of the projects associated with the contracts we reviewed, CAPTRAK indicated that the actual costs were less than amounts originally authorized for these projects. This could reasonably be expected for the three projects that were not yet completed at the time of our review. However, we generally would not expect this for completed projects. For example, the Monorail Project (CA43-002) was budgeted for $378 million. However, now completed, this project actually cost about $203.4 million (per CAPTRAK) - about $174.6 million less than the approved budget amount. Although CAPTRAK data indicates that the project was completed significantly under budget, we found that the actual costs for two contracts (EWR 124.015 and EWR 124.016) exceeded those contracts' original bid amounts by about $4 million and $5 million, respectively. Further, another contract (EWR 124.017) had an overrun of about $15 million.

Our analysis of CAPTRAK data also indicated that actual expenditures exceeded the authorized allocations by 15 percent or more (by amounts ranging from $356,182 to $3,628,564) for 11 of the 42 completed projects. Actual expenditures exceeded the authorized allocations by $1 million or more for six projects. As such, we question whether Authority officials obtained the required spending authorizations from the Board for the projects in question. Moreover, based on our analysis of CAPTRAK data, we question the effectiveness of the process Authority management uses to approve and review the amounts allocated and expended for major capital projects.

If capital program status reports provided to executive management indicate that the Authority routinely completes projects under budget, such reports could mislead executive management about the actual effectiveness of the Authority's capital program management. As noted previously, the Authority issued many hundreds of change orders, often for amounts significantly in excess of 10 percent of original contract amounts, for its larger capital programs. Also, we concluded that change order costs often could have been avoided or minimized, through better project planning and design. Thus, we believe that capital project managers should take steps to more accurately project and revise estimated project costs. Also, more detailed information regarding change orders and contract cost overruns should be provided to the Board and executive management to enable them to adequately monitor the effectiveness of capital program management.

In responding to the draft report, Authority officials stated that the Authority's current process to estimate capital project costs was rational and consistent with industry practice. However, officials added that they recently assessed the processes used to estimate capital project costs. As a result of this assessment, officials revised the project cost template and lowered estimated total costs by reducing project contingency and allocations for planning and engineering. Officials believe that this change should provide more consistency between final actual costs and Board-authorized amounts in the future.

Authority officials further stated that authorized amounts should not be revised, with the exception of project re-authorizations to increase spending. We maintain that authorized amounts should be adjusted upward or downward as circumstances warrant. However, the amount of the originally authorized amount should also be retained and reported so that the impacts of any adjustments to the authorized amount can be readily determined.

Officials also stated that they would strengthen procedures to ensure that capital project allocations approved by the Board are entered into CAPTRAK on a more timely basis.

Recommendations

9. Formally assess the process used by capital program managers to estimate the costs of major construction projects. Specifically, capital program managers should determine if steps can be taken to help ensure that estimates for major, long-term projects can be made more accurately.

10. Establish a process for the formal periodic review of project cost estimates, especially for major long-term projects. Depending on changes in inflation rates, market factors, and any other major factors identified, revise cost estimates to more accurately project anticipated final project costs.

11. Ensure that appropriate Board approval is obtained to expend funds materially above the levels previously authorized by the Board. Also, ensure that CAPTRAK is timely and accurately updated for any changes in allocation amounts approved by the Board.

The Port Authority of New York and New Jersey
Summary of Ten Selected Contracts and Their Related Change Orders
As of February 1997

Contract Number	Contract Title	Award Amount	Initial Auth. Extra Work	Work Done By Contractor	No. of C.O.s	Increased Contract Value
114.001	Design/Const. APM system	$142,395,000	$14,239,500	$145,958,000	78	0
124.015	MCF Building	8,755,315	876,000	13,855,000	241	$4,223,685
124.016	Monorail Remote Stations	16,886,000	1,689,000	20,887,000	60	2,312,000
124.017	Monorail Terminal Stations	14,951,000	1,496,000	29,520,000	335	13,073,000
174.048	International Terminal	44,450,000	4,445,000	56,485,000	350	7,590,000
584.001	RWCP #3	13,730,000	1,374,000	16,670,000	106	1,566,000
584.002	RWCP #4	41,077,000	4,108,000	44,547,000	98	0
110.115B	Aircraft Rescue	10,027,793	1,505,000	12,342,000	23	809,207
110.082	Elec. Sys. & Door Modification	4,788,500	1,000,000	7,660,000	37	1,871,500
320.005	Airport Traffic Control Tower	26,640,000	2,664,000	29,733,115	195	418,115

Exhibit A

The Port Authority of New York and New Jersey
Summary of Budgeted and Actual Costs for Completed Projects Per CAPTRAK
As of April 1997

PROJECT NUMBER	CLOSE-OUT DATE	AMOUNT EXPENDED	AMOUNT BUDGETED	PERCENT OF BUDGET EXPENDED	AMOUNT SPENT OVER (UNDER) (BUDGET)
CA-32-005	06/30/92	$29,716,720	$58,656,000	50.66	($28,939,280)
CP91-006		5,983,253	4,494,000	133.14	1,489,253
CWO2-006		24,911,783	31,742,000	78.48	(6,830,217)
CR08-013		10,330,126	14,924,000	69.22	(4,593,874)
CPO8-040	09/21/94	646,070	646,000	100.01	70
CP10-012		1,077,520	1,853,000	58.15	(775,480)
CWO2-072	06/02/94	3,039,615	2,990,000	101.66	49,615
CPO9-014		3,349,002	1,340,000	249.93	2,009,002
CP11-015		7,664,290	7,000,000	109.49	664,290
CA03-073		33,852,786	53,701,000	63.04	(19,848,214)
CA03-182		3,136,780	2,636,000	119.00	500,780
CPO8-036		2,180,182	1,824,000	119.53	356,182
CA04-012		3,609,926	3,125,000	115.52	484,926
CPO8-005		17,461,859	19,712,000	88.59	(2,250,141)
CA32-004		46,884,234	68,448,000	68.50	(21,563,766)
CA04-081		10,731,963	7,907,000	135.73	2,824,963
CA04-076		27,524,179	74,533,000	36.93	(47,008,821)
CP11-014		10,628,564	7,000,000	151.84	3,628,564
CA03-189		2,801,553	2,596,000	107.92	205,553
CA03-177		1,909,833	2,440,209	78.27	(530,376)
CWO2-073		7,914,808	8,253,000	95.90	(338,192)
CA03-131		3,270,220	9,630,000	33.96	(6,359,780)
CA03-079	01/30/97	18,929,515	24,329,000	77.81	(5,399,485)
CA03-170		12,457,747	11,162,000	111.61	1,295,747
CA43-002		203,388,948	378,000,000	53.81	(174,611,052)
CA03-193		3,222,758	2,645,000	121.84	577,758
CA03-183	11/15/96	6,813,636	7,769,000	87.70	(955,364)
CA03-208		4,992,684	3,750,000	133.14	1,242,684
CA03-202		4,329,949	3,706,000	116.84	623,949
CA04-120		866,206	3,074,000	28.18	(2,207,794)
CWO2-035		19,615,517	20,308,000	96.59	(692,483)
CA04-122		4,377	404,000	1.08	(399,623)
CA03-194		3,959,153	8,139,375	48.64	(4,180,222)
CB08-006		20,399,120	31,900,000	63.95	(11,500,880)
CB03-003		29,645,855	53,844,000	55.06	(24,198,145)
CB02-001		39,903,143	41,711,900	95.66	(1,808,757)
CB06-029	1/29/97	474,137	516,700	91.76	(42,563)
CA03-157		2,929,663	2,400,000	122.07	529,663
CA03-195	1/30/97	2,063,260	23,350,000	8.84	(21,286,740)
CPO1-030		-0-	14,887,000	-.0-	(14,887,000)
CWO2-033		24,792,145	24,357,000	101.79	435,145
CWO2-001	08/03/94	1,903,300	1,903,000	100.02	300
	TOTALS	$659,316,379	$1,043,606,184	63.18	($384,289,805)

Exhibit B

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November 4, 1997

Mr. David R. Hancox
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Office of the State Comptroller
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REF.: Office of the New York State Comptroller - Draft Report on the Administration of Change Orders for Capital Programs, dated September 5, 1997

Dear Mr. Hancox:

We have reviewed the referenced report forwarded to Mr. Lewis M. Eisenberg, Chairman of The Port Authority of New York and New Jersey, by your letter of September 5, 1997.

The findings of the report reflect the period of January 1992 through April 1997 and are not based on a statistically valid sample, but rather on a small "judgmental" sample of thirty (30) Change Orders issued. Capital spending during the period under review amounted to over $3.2 billion. However, the aggregate dollar value of the change orders included in the report totaled only $11 million or less than 4/10ths of 1% of the total project cost of all capital spending. Since this sample is not statistically valid, problems cited cannot be extrapolated to be representative of the Agency's process and procedures.

Further, a 1994 benchmarking study conducted by Deloitte & Touche found that Extra Work for Port Authority contracts averaged 8.3% which was near the mid-point of the benchmark peer group. The peer group was comprised of both private and governmental entities. The Deloitte & Touche study indicates that the Port Authority **does not excessively use Change Orders for Extra Work when compared to organizations similar in size.**

For 247 contracts awarded after January 1994, valued at $132M and closed out, Extra Work expenditures totaled 6.7%. This larger sample is more representative of the way Change Orders are administered by the Port Authority in connection with its capital program. Since 1995, the Port Authority policy has reduced the allowance for Extra Work for heavy construction (paving, wharf construction, dredging, etc.) from 10% to 6% and the allowance for building construction has been limited to 8%. For contracts awarded since 1995, Extra Work is averaging about 6%.

Therefore, our general observation is that the findings outlined in the draft report reflect fundamental misunderstandings in certain instances, and misrepresent the Port Authority's use of Change Orders in connection with construction contracts.

Below please find our responses to specific issues raised in the following sections of the draft report.

Frequency and Cost of Change Orders

ISSUE: Authority did not have adequate controls to limit number and cost of change orders.

RESPONSE: This finding is wrong. In every instance, proper authorization is obtained before a Change Order is issued. Post Award Contract Change and Charge Order approval process utilizes a structured approach that requires multi-department input and approval. Once the Resident Field Engineers are notified of the need of a change, the PACC is routed through Engineering and the Line Department for approval, and a cost proposal is requested from the contractor. Upon receiving the contractor's cost proposal and obtaining the above-cited approvals, the Resident Field Engineer evaluates the contractor's estimate. If cost is within acceptable levels, a change order is prepared; if not, negotiation commences and the change may proceed on a net cost basis or be rejected. The change order, if accepted, is routed to the appropriate manager for signature and then forwarded to the contractor who signs and returns a copy of the change order (conformance) to indicate acceptance. According to Deloitte & Touche, "Although administratively intensive, current control mechanisms serve as an appropriate check and balance on the extra work approval processes."

Further, we do not agree with the auditors' position that there should be a limit on the number of Change Orders issued against a contract. If the total cost of the change orders fall within the authorized allowance then critical issues are: whether work is properly authorized, the changes are necessary, and construction is not delayed.

ISSUE: PA issued Change Orders representing nearly 14% of original contract amounts exceeding the Authority's 10 % goal for extra work.

RESPONSE: The statement that 14% was spent on Extra Work at EWR is in error. Extra Work accounted for approximately 10%, meeting the Agency's goals, while Supplemental Work and Breach Recovery Work accounted for approximately 4%. The report fails to recognize the difference between Extra Work, Supplemental Work and Breach Recovery costs.

ISSUE: Contracts EWR-124.015 and EWR-124.017 are cited as examples of contracts with excessive Extra Work.

RESPONSE: These contracts are poor examples of excessive Extra Work because there were exceptional circumstances in which we breached the contractors. As a result, a large proportion

of the expenditures was for Breach Recovery Work not Extra Work. Most significantly, advancing the contracts in this manner enabled the Port Authority to complete the work and avoid potential claims by the contractor for the $140 million Monorail Design-Build Contract.

ISSUE: Contract EWR.174.048 had excessive change orders increasing aggregate value of base contracts by 13%.

RESPONSE: Contract EWR-174.048 was a fast-track contract. As a result, in order to accelerate this project, the design and construction stages were advanced on a parallel track. In addition, the terminal serves a number of federal agencies such as Immigration, Customs, Agriculture, Fish and Wildlife, and Public Health, over which the PA has no control. These agencies continued to have changes and modifications even after construction was completed.

ISSUE: Financial review for one contractor was not properly performed and, as a result, the Port Authority incurred significant amounts of extra costs on Contract EWR-124.015.

RESPONSE: We believe that the contractor's negative working capital position as of May 31, 1991 had little to do with the contractor's breach of contract and was not truly indicative of their ability to perform and pay its short-term debts. The Port Authority did require the contractor to post a payment and performance bond to protect itself against the possibility of such increased costs. The contractor did consistently operate with negative working capital, which was supplemented by amounts due from affiliates and shareholders, which is classified as a non-current asset. However, as of May 31, 1992, the contractor did in fact have a positive working capital position and was still declared in breach of contract later that fiscal year.

Incomplete Project Designs and Scope Changes

ISSUE: Design Division "omitted obvious, necessary design specifications prior to awarding contracts" .

RESPONSE: This is not accurate. There is a quality assurance system which ensures that no obvious or critical omissions are made. The Engineering/Architecture Division has a published quality control plan which delineates this process in detail and is attached.

ISSUE: Change Orders were issued because of incomplete project designs.

RESPONSE: It is not always possible, nor is it the best policy, to award contracts only after complete design drawings are available. If the beneficial use of a facility can be achieved faster without the development of non-critical design details, we believe that this strategy serves the best interest of facility's tenants and patrons.

Therefore, we believe that our management system is appropriate to achieve our objective of completing work within time and cost constraints.

ISSUE: Design changes on Contract EWR-124.016 resulted in change orders.

RESPONSE: It is necessary to first note, the EWR/Monorail System, which was estimated to cost $375 million, was delivered successfully. In order to accomplish this, the design schedule was extremely tight. After the contract was awarded, staff reviewed the shop drawings at which time inconsistencies between the architectural and structural steel contract drawings were discovered. There were no flaws, but had any known flaws been in the document, they would have been corrected in an addendum to the contract prior to bid. The schedules for the monorail stations had to be maintained to avoid providing the Monorail Vendor a reason for filing a claim for delaying access to the stations.

ISSUE: Change Order #30 (Port Authority CC #13) in the amount of $349,423 was required because certain specifications for signs were omitted from final bid document.

RESPONSE: The additional signage was not part of the original contract because multi-lingual signage was not envisioned at the time of the bid. If the additional signage had been included in the original contract, the bids would have reflected these additional costs. The contractor's proposal of $349,423 was lower than our estimate for the cost of this work. If this additional work had been separately bid, the cost would have been higher since a new contractor would have incurred overhead and mobilization costs.

ISSUE: Under Contract JFK-584.002, Authority allowed construction to proceed despite design problems, with the assurance that minor design problems would be corrected via subsequent change orders.

RESPONSE: Given the cost implications for both the contractor and the Port Authority that are associated with construction delays, it would not be prudent to postpone construction due to non-critical design flaws. We further believe that it is more economical and practical to proceed on schedule with construction with the assurance that any minor problems will be corrected through the use of a Change Order.

ISSUE: Change order for distribution system for primary power for Monorail resulted from an oversight by the Authority.

RESPONSE: Our rejection of the contractor's initial proposal for the 27KV option at $14,070,000 resulted in significant life cycle savings for the Port Authority. According to the bid documents, primary power for the Monorail could be provided at either 265/460V or 27KV. Von Roll, the

Monorail contractor, proposed the 27KV option to be paid for as Extra Work at a cost of $14,070,000. The Port Authority chose not to select this option due to its excessive cost. As Von Roll staff proceeded with their design, they realized that the 460 volt option would cost them more to complete the base contract. Therefore, Von Roll then proposed the 27KV option for $1 million in Extra Work. This resulted in a savings over the life of the project of $322,000 per year in energy costs or $3.8 million calculated on a present value basis. There was no design oversight.

Use of Change Orders and Supplemental Agreements

ISSUE: Authority awarded millions of dollars for work outside scope of corresponding contracts through change orders and supplemental agreements rather than bidding work competitively.

RESPONSE: Prior to 1995, costs associated with out-of-scope work were sometimes processed by way of a Change Order. However, since 1995, all significant out-of-scope work is executed with the contractor via a Supplemental Agreement. The Supplemental Agreement is separately authorized and is usually publicly bid to three or more active Port Authority contractors. There are certain instances when it is appropriate to negotiate with an active contractor. In either case, we develop an independent estimate and use professional judgment to analyze the time and costs issues striving to do the work in the most cost and time efficient manner.

Management Information and Project Funding Allocations

ISSUE: Executive management generally have not received complete, accurate and timely summary reports on capital construction costs.

RESPONSE: The completeness of the report received by executive management is determined by the fact that data contained in these reports is obtained from CAPTRAK, the capital tracking plan, the General Ledger, and CONTRAK, the construction cost tracking system. By corroborating project cost and schedule information with sources other than CAPTRAK, staff ensure that summary capital program costs reported to the Board and executive management is complete and accurate and are received on a timely basis. Samples of those reports have been provided to the auditors.

Management Information Systems

ISSUE: Different departments maintain databases on capital construction costs.

RESPONSE: This is accurate and necessary. All capital project **estimated** cost data is contained in CAPTRAK and all **actual** cost data is derived from the General Ledger. In addition, the Engineering Department's CONTRAK system, a dedicated construction tracking system, provides a roll-up of contract-level data such as monthly accrued liability and work in place

reporting to the General Ledger. Thus, although these systems are separately maintained to serve different information reporting needs, they are all interdependent.

ISSUE: As a result of CAPTRAK and CONTRAK not being linked, Authority cannot produce contract-level data associated with specific projects.

RESPONSE: The Board and executive management of the agency receive periodic project status updates, which are developed and reviewed by staff prior to submission. Therefore, it is not necessary to link CAPTRAK and CONTRAK to produce summary- level reports for the Board.

Project Funding Allocations and Reported Expenses

ISSUE: Management should strive to establish capital construction budgets which include accurate estimates of costs.

RESPONSE: The report's finding that the total amount authorized for the 42 sample projects shown on Exhibit B exceeded the aggregate expenditures for the same projects by 37% does not accurately reflect updated cost information contained in CAPTRAK, such as financial expense associated with capital projects. Further, program-wide administrative costs for airport redevelopment programs are separately tracked. Both financial expense and program-wide administrative costs are charged to specific projects in CAPTRAK **after the completion of each project**. The practice of allocating financial expense at project completion should be eliminated with the replacement suite of financial systems, including PACE and the General Ledger. Currently, however, a comparison of capital project costs recorded in the General Ledger to amounts authorized for those projects provides a more accurate comparison.

ISSUE: Given that projected inflation rates exceeded actual inflation rates, there exists a high risk that amounts initially approved for projects were excessive.

RESPONSE: Staff develop project budgets according to the Capital Project and Authorization Process Guidelines. The project cost template we use takes into account inflation, and other project costs such as engineering and financial expense appropriate at that time .

Responses to Recommendations Contained in the Report

Recommendation #1: Ensure that goals to limit the dollar value of Change Orders issued against contracts are met. Consider establishing a formal policy to limit subsequent additional extra work after contracts are awarded.

RESPONSE: In the past two years, our performance has exceeded the goal of current Port Authority policy stipulating Extra Work should not exceed 8% for buildings and 6% for heavy construction. We will continue to examine our existing practices to identify whether there are other opportunities to strengthen our construction cost control practices.

Recommendation #2: Award contracts only to contractors who are financially qualified to perform the job.

RESPONSE: We agree with the report's recommendation that contracts should only be awarded to contractors who are financially qualified to do the job. The Port Authority's process for reviewing proposals and evaluating the qualifications of bidders prior to making a determination of award includes, among other things, a determination of whether the proposal is in proper form and whether the bidder has the technical qualifications, including requisite experience, is a responsible contractor, and has the financial resources to perform the work. To determine the financial qualifications of a prospective contractor, the Port Authority has a long-standing practice of reviewing financial performance (i.e. Dun & Bradstreet reports).

Recommendation #3: Ensure that design reviews are thorough enough to detect any major problems with the design.

RESPONSE: The Port Authority's Engineering Department has a formal quality assurance program to audit completed design work to ensure that no obvious or critical omissions are made. Inherent in this process is the concept that safety is the primary concern, and that it is acceptable to have minor imperfections in non-life safety items and details.

Recommendation #4: Coordinate activities of participating departments before contract awards are made to minimize the number of Change Orders during construction stage.

RESPONSE: There is a process in place in which all contract documents are reviewed by all participating departments prior to bidding and award.

Recommendation #5: Minimize the number of design and scope changes by defining the scope of the project adequately before the contracting process is initiated.

RESPONSE: In theory, it is easy to advocate that the contract scope should be fully developed before the contract process is initiated. However, in the real world of operating facilities, there are elements that are always undergoing change which could affect the scope of the project contract documents. It is virtually impossible and impractical to design a major structure with utility systems and architectural finishes without several after-contract award refinements. This is particularly true for a facility such as Terminal B at Newark International Airport where there are many clients, including several federal agencies.

The use of Change Orders to make refinements identified during mock-ups, or during the shop drawing phase of a contract is a cost effective practice. The time and expense associated with the verification of every item contained in plans and specifications, to investigate in detail any and all unknowns at the project site, and to ensure that no ambiguities exist in the plan and specifications, would cost significantly more than the current procedure of preparing plans and specifications using a reasonable and prudent standard of care. Indeed, it is generally less expensive to make these refinements after the contractor has selected the final material sources and fabrication methods than to insure extensive design costs on non-critical details.

We believe that our management system is appropriate to achieve our objective of completing work within time and cost constraints.

Recommendation #6: Competitively bid all capital project work (above a predetermined dollar amount) outside the scope of original contracts unless it can be clearly demonstrated that this process will result in a substantial increase in cost or project delay.

RESPONSE: The Port Authority has competitively bid approximately 95% of the value of construction contracts since April 1993 which resulted in awards of nearly $1.5 billion. In some instances, due to business consideration, operational issues, or to facilitate capital program management, it is desirable to have additional work performed by a contractor even though it is outside the scope of the original contract. Since 1995, any significant out-of-scope work has been executed with a contractor via a Supplemental Agreement. Supplemental Agreements are separately authorized and, typically, are competitively bid by three or more active Port Authority contractors. It should be noted that supplemental agreements are used on an exception basis and represent 4% of all PA construction contracts.

Recommendation #7: Develop procedures to ensure that Post Award Contract Changes are processed in a timely manner and are approved before contractors begin change order work.

RESPONSE: Currently, the PA's PACC's are processed in a timely manner as determined by Deloitte & Touche in their 1994 benchmarking study when we compared the Port Authority to other benchmarking participants. We will monitor the process to ensure these documents continue to be processed in a timely fashion.

Recommendation #8: Ensure that management information systems can provide executive management with accurate, complete, and timely information on the costs and status of capital projects. Consider linking CAPTRAK and CONTRAK and including data from computerized systems used by field consultants to produce meaningful management reports.

RESPONSE: We have initiated a project to replace our suite of financial systems, including the PACE General Ledger. The replacement systems should provide greater flexibility and an opportunity to improve reporting timeliness. At the same time, we will be reviewing CAPTRAK

to assess whether we can make immediate improvements in the quality and the timeliness of the information available from this capital program reporting system. The Board and executive management are provided with periodic project status updates, based upon their reporting requirements, which are developed and reviewed by staff prior to submission. It is not necessary to link CAPTRAK and CONTRAK to produce meaningful management reports.

Recommendation #9: Formally assess the process used by capital program managers to estimate the costs of major construction projects. Specifically, capital program managers should determine if steps can be taken to help ensure that estimates for major, long-term projects can be made more accurately.

RESPONSE: The current process used by the Port Authority to estimate capital project costs is rational and consistent with industry practice. Staff develop project budgets according to established project development guidelines. Construction cost estimates are developed based upon completed designs, methods and means of construction, and current industry data pertaining to crew sizes, labor and equipment productivity and estimated time of completion for each contract element. The project cost template takes into account inflation, financing cost and planning and engineering. In a recent assessment of the process used by capital program managers to estimate project costs, we revised the project cost template and lowered total project cost by reducing project contingency and allocations for engineering and planning.

Recommendation #10: Establish a process for the formal periodic review of project cost estimates, especially for major long-term projects. Depending on changes in inflation rates, market factors, and any other major factors identified, revise cost estimates to more accurately project anticipated final project costs.

RESPONSE: Project costs are authorized by the Board and include estimated amounts for construction, planning and engineering, general administration, financial expense and a contingency allowance. These authorized amounts should not be revised as suggested by the auditors, with the exception of a project re-authorization for increased spending, to reflect lower project cost estimates. The authorized amount serves as an important benchmark in measuring estimates against actual costs - but more importantly serves as an expenditure control mechanism within the provisions of the PA by-laws.

The above cited recent change to the project cost template should serve to provide more consistency between final actual costs and authorized amounts.

Recommendation #11: Ensure that appropriate Board approval is obtained to expend funds materially above the levels previously authorized by the Board. Also, ensure that CAPTRAK is timely and accurately updated for any changes in allocation amounts approved by the Board.

RESPONSE: Projects that are forecast to overrun the initial Board authorization are presented to the Board for re-approval. Similarly, any construction contracts that require additional extra work are also presented to the Board for re-approval. We will strengthen our procedures to ensure that capital project allocations approved by the Board are entered into CAPTRAK on a more timely basis

In the past two years, the Port Authority has consolidated its capital program management function and streamlined its project delivery process. As a result of these changes, projects are started faster and completed quicker, and the aggregate dollar value of construction awards has increased, which has helped to expand the opportunities for New York and New Jersey contractors to perform work on our capital projects. Despite your disclaimer of devoting "little effort to reviewing operations that may be relatively efficient or effective" and not addressing "activities that may be functioning properly," we believe that some of our accomplishments also deserve mention in your final report.

While we take issue with many of the findings contained in the draft report, we, never-the-less, appreciate the efforts of your staff to identify ways in which the Port Authority can improve its administration of capital projects.

Sincerely,

Charles F. McClafferty
Chief Financial Officer

cc: Hon. Lewis M. Eisenberg, PANY/NJ
Mr. Robert E. Boyle, PANY/NJ
Ms. Patricia A. Woodworth, NYS/DOB