



KENNETH J. RINGLER, JR.
COMMISSIONER

STATE OF NEW YORK
EXECUTIVE DEPARTMENT
OFFICE OF GENERAL SERVICES
MAYOR ERASTUS CORNING 2ND TOWER
THE GOVERNOR NELSON A. ROCKEFELLER EMPIRE STATE PLAZA
ALBANY, NEW YORK 12242

ROBERT J. FLEURY
FIRST DEPUTY COMMISSIONER
WILLIAM F. O'CONNOR, AIA
DEPUTY COMMISSIONER
DESIGN AND CONSTRUCTION

Mr. John Rose
Director of Program Planning
Capital Planning
State University of New York
Room S-223, State University Plaza
353 Broadway
Albany, New York 12201-1946

June 27, 2003

RE JUN 27 11:58 PM

Re: **Professional Consultation S9795**
Evaluate Elevators Nos. 3, 4, 7 and 8
SUNY Systems Administration
State University Plaza
353 Broadway
Albany, New York

Dear Mr. Rose:

Our report regarding the above referenced service is attached for your review.

If you have any questions or require any additional information about the report, please contact me at 518-474-0278. For ease of mail distribution, please continue to direct all project related correspondence to Michael J. Casey, 35th Floor.

Sincerely,

Terry W. Britton
Team Leader
Division of Design

tb

Attachment

cc: Files: J. Dirolf, OPC

Feasibility Study

Evaluate Elevators Nos. 3, 4, 7 and 8

SUNY Systems Administration
State University Plaza
353 Broadway
Albany, New York
Project No. S9795

prepared for the
State University of New York

prepared by
Terry W. Britton
Team Leader
Division of Design
OGS Design and Construction
June 27, 2003



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**EXECUTIVE DEPARTMENT
OFFICE OF GENERAL SERVICES
DESIGN AND CONSTRUCTION GROUP - DIVISION OF DESIGN**

PROFESSIONAL CONSULTATION REPORT

Professional Consultation S9795

June 27, 2003

Evaluate Elevators Nos. 3, 4, 7 and 8
SUNY Systems Administration
State University Plaza
353 Broadway
Albany, New York

INTENT:

Evaluate the operating condition of the subject elevators, which were recently modernized, and review the log of callbacks to determine a resolution to the probable causes of the problems, which have recently plagued the Facility. Additionally, review SUCF Project No. 36052 to determine whether all contractual obligations have been met.

FIELD SURVEY:

On June 5th, 11th and 23th, 2003 Terry Britton and Charlie Koubek from this office conducted field surveys at the Facility to evaluate the problems being encountered with Elevator Nos. 3, 4, 7 and 8. They met with the following personnel:

Jerome Smart, R.A. – SUCF
Michael Behrman, P.E. – SUCF
John Cheslick, P.E. – Smith & Mahoney
David Bonjolo – KONE Inc.
Darrell Yates – KONE Inc.

FINDINGS:

The elevator installation in question is approximately 30 years old and consists of four passenger elevators; two of which are located in the central tower and two in the North tower, all of which are of Westinghouse Elevator Co. manufacture. The elevators have the following characteristics:

- Elevator Nos. 3 and 4 are overhead geared traction machines having a capacity of 2500lbs. with a speed of 350 fpm, serving the basement, 1st through 5th floors.
- Elevator Nos. 7 and 8 are basement geared traction machines having a capacity of 2000lbs. with a speed of 350 fpm, serving the 1st through 13th floors.

These elevators were recently modernized by Kone Inc. in which the primary focus of the project was the following:

- Provide AC variable frequency drives and motors with closed loop speed control.
- Provide microprocessor based control systems with closed loop position/landing system.
- Provide machine room and hoistway wiring.
- Provide hall and car fixtures.
- Provide removable type cab panels.
- Provide car doors including operators, clutch, gate switch and infrared door reopening devices.

- Provide hoistway door interlocks.

Subsequent to the beneficial occupancy of these elevators, various problems including entrapments have occurred which has raised concern about the reliability of the recently modernized elevators. A majority of the problems including various entrapments have been associated with Elevator No. 7. Upon review of the contract documents and various documentation of problems, a field survey was conducted in which we offer the following observations:

Findings apply to all elevators unless specifically noted otherwise. The following items are required per contract and should be addressed by the Contractor.

A. Machine Room Inspection:

1. The building system grounding conductor was not connected to the lug in the disconnect switch for Elevator No. 3.
2. The building system grounding conductor was not connected to the existing emergency transfer switches.
3. The fire alarm wiring was not connected to the elevator control system for automatic elevator firemen's recall operation on Elevator Nos. 7 and 8.
4. The fire alarm installation did not contain the third circuit in the machine room for automatic elevator firemen's recall operation.
5. The machine rooms did not contain a video monitor and keyboard.
6. The brake contact for Elevator No. 7 was missing its cover.
7. The installation of drive isolation transformers to reduce any line distortion and radio frequency interference.
8. The power wiring installed from the motor drive to the hoist motor was installed in the same raceway as the control wiring. Though the power wiring is shielded; it remains good practice not to install power wiring in the same raceway as control wiring to reduce the amount of electro-magnetic interference.
9. Various wiring is located in thin-wall conduit, which is not permissible by contract.

B. Hoistway Inspection:

1. All hoist and governor rope ends require seizing.
2. Various spirator door closers require adjustment.
3. The travel cable transition into the hoistway duct riser needs an appropriate transition piece to prevent damage to the cable for Elevator No. 3.
4. Various hoistway duct risers are missing covers.
5. The governor rope for Elevator No. 8 is making contact with the jaw of the governor and should be re-aligned.
6. One of the hoist rope shackle rods on the counterweight should be cotter-pinned beneath the jamb nut.
7. Remove all existing raceway and wiring superceded by the work.
8. The spacing of the retainer clips for the hoist rope terminations are incorrect.
9. The car top emergency exits do not contain electric contacts.
10. The anti-rotation cables used with the hoist rope terminations did not contain a retainer clamp on Elevator No. 4.
11. The car top GFCI receptacle is wired incorrectly on Elevator No. 4.

12. The hoistway door interlock at the 1st floor on Elevator No. 8 contains a bent keeper assembly.
13. The power supply unit for the door-reopening device on Elevator No. 8 has connectors, which have been subjected to accidental contact and damage. Adequate protection should be provided for these connectors to avoid future problems.
14. The pit stop switch on Elevator No. 8 is labeled incorrectly.

C. Corridor Inspection:

1. Remote selector switches for emergency power were not installed.
2. The position indicator and hall pushbutton station at the first floor for Elevator No. 3 were not installed flush and level.
3. The position indicator panel in the safety office needs to be re-connected to the elevator control system.
4. The hoistway door gibs were not replaced.
5. The hoistway access switches were not provided.
6. Various hall pushbutton station back boxes need to be anchored to the building structure.
7. The hall pushbutton station at the basement floor on Elevator Nos. 3 and 4 has been partially removed by building personnel to install a condensate drain line, which presents an electrical hazard to both equipment and personnel.
8. The up thrust rollers on the hoistway doors at 1st floor requires adjustment.

D. Cab Inspection:

1. The cab lighting does not contain lenses.
2. The car pushbutton for the 4th floor on Elevator No. 7 is not flush with the faceplate.
3. The alarm button in the auxiliary car operating panel on Elevator No. 8 did not illuminate when pressed.
4. The in-car telephones do not provide an identifying address at the safety office as required per the Americans with Disabilities Act.

In addition to the above findings, we would like to address the following problems and complaints, which have recently plagued the Facility and offer our professional opinion on each:

1. Elevator Nos. 7 and 8 have received many complaints because of the bouncing action being experienced when arriving at a floor. Part of this bouncing action is due to the inherent fact that these are basement type machines with excessive cable length, which ultimately increases the amount cable stretch. When the cables are new one can expect additional stretch due to the final setting of the strands around the fiber core, which accentuates the bouncing action. Since this is a light capacity elevator the final setting of the hoist cables may take up to a year, which when complete will reduce the amount of bouncing. In addition, the original manufacture duty table recommended the use of four ½" extra high strength steel cables, which was confirmed with Kone Inc.

We have had Kone Inc. decrease the amount of acceleration and de-acceleration to and from the floor in an effort to reduce some of the bouncing. Further effort should be made to periodically check the tension in the cables; currently the tension appears to be equally distributed between the

cables. Another solution which would reduce the amount of bounce minimally would be to install five ½” cables. The existing sheaves were designed to accept five ½” cables; however the sheaves would require turning to enable all cables to seat in the grooves evenly to avoid unequal traction and tension. Since these sheaves are heat treated and appear to have reached their service limit, I would not recommend this work unless the sheave rings are replaced which is not feasible for the minimal gain that would be recognized.

2. Various elevators have experienced problems whereby a passenger enters the elevator, presses the desired button; the doors close, but the elevator does not move. This problem has been attributed to the tight tolerance of the car door clutch with respect to the hoistway door interlock actuating rollers. It appears that the car door clutch when in the retracted position was engaging the hoistway door interlock rollers with sufficient force to activate the hoistway door interlock thereby not permitting the movement of the car.

To resolve this problem Kone Inc. has removed a bar shim from the car door clutch to allow more range of motion between the clutch and the hoistway door interlock rollers.

3. Elevator No. 7 has experienced multiple shutdowns, which we understand have been logged as “loss of voltage” faults on the motor drive. Initially, Kone thought there might be a fluctuation in the building system voltage affecting their motor drives.

The problem was found to be a faulty crimp connection on the dynamic braking resistor that has recently been found to be a production problem and is now being addressed on all affected installations. In addition the DRV/CPU circuit board, which is an interface to the motor drive, was found to be faulty and was replaced. We have also confirmed with Kone that their motor drive is capable of operating within a +/-10% building system voltage fluctuation. Additionally, we conducted voltage and harmonics testing and found no unusual building system voltage fluctuations or line distortion.

4. Various complaints have been received about the operation of the car and corridor pushbutton fixtures. These fixtures are of the vandal resistant design, which will prevent damage to the contact block in the event of high impact to the button. Since these buttons require greater pressure to activate than the previous buttons, passengers have experienced buttons that do not activate at times, whereby the doors close and the elevator does not move from the floor giving passengers the perception that they are trapped.

Once the passengers become more familiar with the new fixtures this problem should dissipate. With all the other recent problems associated with these elevators, the level of scrutiny of the entire installation has been high which has compounded the problem.

RECOMMENDATIONS:

The only additional work that I would have recommended as part of this contract would have been the following:

- Replace all hoistway door closers, relating cables and nylon track liners. Install door track stops to prevent the door rollers from going off the track.
- Replace the chain compensation on Elevator Nos. 7 and 8 and install encapsulated type compensation.
- Install emergency power and pre-transfer signal from existing transfer switches to elevator control systems to enable the elevators sufficient time to travel to the nearest floor before transferring from emergency power back to normal building power.

If the budget permits, I would recommend getting a proposal from Kone Inc. for the above items, to be completed via a change order to their current contract

CONCLUSION:

Overall, the work performed by Kone Inc. was found to be within industry standards with the exception of the outstanding contractual issues as denoted above. I see no reason why Elevator Nos. 7 and 8 cannot be placed back in automatic operation without the use of an attendant.