



STATE OF ILLINOIS

OFFICE OF THE AUDITOR GENERAL

ILLINOIS STATE TOLL HIGHWAY AUTHORITY

HELICOPTER SPECIAL INQUIRY

JUNE, 1994

WILLIAM G. HOLLAND

AUDITOR GENERAL

STATE OF ILLINOIS
OFFICE OF THE AUDITOR GENERAL

ILLINOIS STATE TOLL HIGHWAY AUTHORITY
HELICOPTER SPECIAL INQUIRY

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OFFICE OF THE AUDITOR GENERAL
WILLIAM G. HOLLAND

Members of the Legislative
Audit Commission
622 William G. Stratton Building
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Dear Commission Members:

Pursuant to request from Legislative Audit Commission Resolution No. 100, enclosed is our special inquiry concerning the Toll Highway Authority's utilization of its helicopter. This special inquiry examines the type of equipment, associated costs of flights, recorded users and purposes of flights, and other relevant information.

Please contact me if you have any questions concerning this inquiry or need additional work done on this subject.

Yours truly,

A handwritten signature in black ink, appearing to read "William G. Holland".

WILLIAM G. HOLLAND
Auditor General

June 16, 1994

ILLINOIS STATE TOLL HIGHWAY AUTHORITY

HELICOPTER INQUIRY

On March 3, 1994, the Legislative Audit Commission adopted Resolution No. 100 which directs the Auditor General to conduct a special inquiry regarding the utilization of helicopter flights by the Illinois Toll Highway Authority. The Resolution directs our office to:

- Determine the type of equipment utilized for such flights, including the date purchased and hours logged;
- Determine the cost associated with such flights;
- Determine the recorded users of such flights and the recorded numbers, times, and purposes of the flights by each user according to Authority records;
- Examine other comparable toll highway authorities' use of such transportation;
- Determine the number and percentage of flights used for:
 - emergency
 - engineering and planning
 - administrative (Toll Highway)
 - administrative (other state agencies)
 - other
- Determine whether the Toll Highway received reimbursement for costs incurred for flights of a personal or otherwise non-official purpose;
- Determine whether the per mile charge is sufficient to cover the costs incurred and how the per mile charge compares with those of private or public air transportation, and
- Determine whether the Toll Highway has analyzed the cost-effectiveness of its air operation and examined whether alternate means exist to fulfill its travel needs (such as leasing aircraft or using private or public commercial aircraft on an as needed basis).

SCOPE AND METHODOLOGY

In performing this special inquiry, we interviewed officials from the Illinois Toll Highway Authority (THA). We contacted representatives from Bell Helicopter Textron Corporation. We reviewed documentation from 1992 and 1993 made available to us at the THA. We contacted the International Bridge, Tunnel, Turnpike Association and conducted a telephone survey of nine other similar Authorities or Commissions in eight other states. We also contacted various private and public air transportation companies. We also examined THA helicopter daily flight logs and pilot records from 1992 and 1993. (See Appendix D)

This special inquiry is a focused review and is not comparable to an audit conducted under generally accepted government auditing standards and the audit standards promulgated by the Office of the Auditor General at 74 Ill. Adm. Code 420.310. While standard audit procedures were used to the extent feasible, conclusions and some information presented herein are based upon agency representations which have not been independently confirmed.

BACKGROUND

Prior to the helicopters, since approximately 1964, the THA used 2 small airplanes for air speed checks and executive transport. The THA continued to use the airplanes until 1975.

Over the past 27 years, the THA has owned, at separate times, 3 helicopters. Each helicopter was purchased from Bell Helicopter Textron Corporation. According to the THA, it uses a helicopter for aerial views of construction sites, emergencies, transporting the Governor and THA officials, and various internal purposes.

The THA purchased their first helicopter in January 1967. They kept it 20 years and then sold it to the State Police in 1987. They bought their second helicopter in March 1987 and traded it in for the third and current helicopter in 1993. The third helicopter was purchased in May 1993 but not put in service until August 1993 (in order to install instruments, customized equipment, etc.).

EXHIBIT 1**Helicopter Purchases**

| <u>Date Purchased</u> | <u>Model</u> | <u>Purchase Price</u> | <u>Total Cash Outlay</u> |
|-----------------------|--------------|---------------------------------------|---------------------------------|
| Jan. 1967 | Bell 206A | \$ 133,912 = | \$ 133,912 |
| March 1987 | Bell 206L3 | \$ 727,985 + 255,802 (equipment) = | \$ 983,787 |
| May 1993 | Bell 206L4 | \$1,022,160 +165,986 (equipment) | |
| | Total Cost | \$1,188,146 - 465,000 (trade-in) = | \$ 723,146 |
| | | | Total <u>\$1,840,845</u> |

- The first helicopter, a Bell 206A, was purchased in 1967 for \$133,912. THA sold the 206A to the State Police for \$75,000 cash and \$50,000 in training credits for a total of \$125,000. The Bell 206A is a five-passenger Bell Jet Ranger.
- The second helicopter was a Bell 206-L3. The purchase price in 1987 was \$727,985 plus \$255,802 for the installation of customized equipment such as slide-down window, heater/air conditioning system, pneumatic door opener, radio, oil filter and kit, and instrument flight package. The L3 was a faster aircraft (than the 206A) and carried 7 passengers. Although it carried more passengers, it was a heavy aircraft which therefore reduced the operating capacity and restricted either the number of passengers that the aircraft could carry or the amount of fuel that could be stored during flights.
- The current helicopter is a Bell 206-L4, which carries the same number of passengers as the L3, but is a lighter aircraft and the gross weight capacity is therefore increased. The total price for the L4 was \$1,022,160, plus \$165,986 for installation of customized equipment, less a trade-in of \$465,000 for the L3, for a total outlay of \$723,146. The customized equipment includes items such as a radio, pneumatic door opener, instrument flight package and heater/air conditioning system.

The three helicopters have all been single rotor blade aircraft. According to THA officials, there are only five companies in the U.S. that make helicopters and only one that makes single rotor blade crafts (Bell). According to the officials, a single blade craft is more practical for the THA because it can be stored in their hangar/garage on site. A helicopter with 3 or 4 rotor blades would need a building with an extra wide door.

According to THA officials, they estimate their annual usage does not exceed 500 hours a year for insurance purposes. They added that the life of a helicopter can extend as long as maintenance is kept up. Every 1500 hours, the transmission and engine have to be overhauled and every 2400 hours, rotor blades have to be replaced. Every rotating part on a helicopter has a life cycle that calls for required inspection and maintenance.

HELICOPTER USAGE

The helicopter is used primarily for THA personnel, State Police business, transporting the Governor and various emergencies. According to the THA, THA personnel use the helicopter for such things as photographing or video-taping a construction site, transporting executives to meetings, or viewing damage to a toll plaza after a storm. The primary users of the helicopter within THA are the engineering department, authority executives, and legal and finance departments. Other miscellaneous divisions within THA also use the helicopter. State Police use the helicopter for such things as traffic surveys, manhunts, and arranging security for the President, Vice-President, or other dignitaries when they visit Illinois. The Governor uses the helicopter for various state functions and for non-official purposes. For a schedule of flights and hours by passengers using the helicopter in 1992 and 1993, see Appendix C.

For purposes of this inquiry, however, we could not identify the reasons and purposes for each trip. THA does not maintain that information for all helicopter flights. We examined helicopter logs and mission reports for 1992 and 1993. THA documents the trip purpose for most trips (by the use of flight request forms) taken by the engineering, legal, and finance divisions, but this information is not maintained for THA executive flights. Also, most flight requests for the Governor's office list the itinerary, but not the actual reason or purpose of the flight. There was also no documentation available for us to determine whether the helicopter was ever used for personal reasons.

In our review of the logs, we noted some problems and discrepancies. In one case, the logs indicated that the same pilot was flying two helicopters at the same time on the same day. In 7 other cases, no flight times were indicated on the helicopter logs. In 71 cases, we could not determine who the passengers were (40 in 1992 and 31 in 1993). In one case, 1.5 hours were added to the helicopter log with no indication of the reason. We also found 5 cases where there were unexplained gaps in the helicopter tachometer readings and there were no flight logs to explain the gaps. THA officials stated flights occurred during those gaps according to the pilot's Federal Aviation Administration (FAA) report but could not produce the actual flight logs. These problems indicate a lack of controls over the use of the helicopter.

RECOMMENDATION NUMBER 1

Toll Highway Authority officials should monitor the helicopter documentation for completeness and accuracy and ensure adequate controls are in place over the use of the helicopter.

Helicopter Uses

We examined the overall passenger uses for the helicopter in 1992 and 1993 by five general categories:

- Emergencies - Accident situations, emergency manhunts, etc.
- Engineering and planning - THA engineering department uses such as videos and photographs of construction sites.
- THA administrative - Flights for the Executive Director and other THA officials as well as other divisions within THA such as legal and finance.
- Other state agency administrative - State Police non-emergencies and Governor flights for State business.
- Other - Governor flights for non-official purposes.

Exhibits 2 and 3 show the total number of hours flown by each of the main user groups and the number of take-offs and landings for 1992 and 1993. As seen in the exhibits, THA administration and engineering were frequent users. Emergency uses were rare (7 in 1992 and 3 in 1993). As seen in the exhibits, non-passenger take-offs and landings were frequent. The helicopter flies without passengers primarily for maintenance or test flights or when going to pick up a passenger or returning to THA after a passenger is dropped off. The non-passenger "other" category includes such things as taking the helicopter up for a road survey and assisting in a manhunt.

EXHIBIT 2
Helicopter Usage for 1992

| | Number of Takeoffs/ Landings | Percentage | Number of Hours | Percentage |
|--|------------------------------------|---------------|--------------------|---------------|
| Emergency | 7 | 1.6% | 8.8 | 3.1% |
| Engineering | 112 | 25.3% | 107.4 | 37.9% |
| Administration - THA | 53 | 12.0% | 50.4 | 17.8% |
| Administration - Other State Agencies | 92 | 20.8% | 39.3 | 13.9% |
| Non-passenger Flights: | | | | |
| Test Flights | 27 | 6.1% | 10.8 | 3.8% |
| Passenger Pick up/Drop Off | 95 | 21.4% | 45.3 | 16.0% |
| Other | 36 | 8.1% | 12.6 | 4.5% |
| Other (Gov. Non-Official) | 21 | 4.7% | 8.5 | 3.0% |
| TOTAL LOGGED | 443 | 100.0% | 283.1 | 100.0% |

Source: OAG Analysis of THA flight logs

EXHIBIT 3
Helicopter Usage for 1993

| | Number of Takeoffs/ Landings | Percentage | Number of Hours | Percentage |
|--|------------------------------------|---------------|--------------------|---------------|
| Emergency | 3 | 0.7% | 3.1 | 1.3% |
| Engineering | 64 | 15.6% | 49.4 | 20.6% |
| Administration - THA | 78 | 19.0% | 74.5 | 31.0% |
| Administration - Other State Agencies | 70 | 17.0% | 24.2 | 10.0% |
| Non-passenger Flights: | | | | |
| Test Flights | 22 | 5.4% | 9.7 | 4.0% |
| Passenger Pick up/Drop Off | 126 | 30.6% | 59.6 | 24.8% |
| Other | 13 | 3.2% | 6.6 | 2.8% |
| Other (Gov. Non-Official) | 35 | 8.5% | 13.2 | 5.5% |
| TOTAL LOGGED | 411 | 100.0% | 240.3 | 100.0% |

Source: OAG Analysis of THA flight logs

HELICOPTER COSTS

We were asked to determine the cost associated with the THA helicopter flights. In order to determine these costs, we used certain cost accounting principles which helped us establish a unit measure of cost associated with the helicopter usage. We also used "per flight hour" as our unit of measure instead of the "per mile charge" as a basis for comparing and compiling cost since that is the unit of measure used by both the THA and helicopter rental industry. For the purpose of our inquiry, we have defined associated flight cost as the cost necessary to actually fly and operate the helicopter. We did not include various other costs associated with the on-site aircraft hangar such as telephone communications, heating/cooling, lighting and depreciation since they did not contribute to the actual flights of the helicopter.

Direct and Indirect Costs

The helicopter costs are broken down into two categories called direct and indirect cost. Indirect cost consists of pilot's salary and helicopter insurance. These indirect costs will generally remain unchanged regardless of the number of helicopter flights logged.

Direct cost consists of fuel, lubricants, scheduled and unscheduled internal and external maintenance, including parts and labor, and required inspections. According to THA officials, the aircraft maintenance man (THA mechanic), who is also the building maintenance foreman and grounds keeper, devotes 18 percent of his time to servicing the helicopter. However, THA officials were unable to provide current documentation to substantiate or justify the 18 percent allocation. There was no separate accounting of the amount of time the THA mechanic spent servicing the helicopter and performing his other duties. Based on their representation, we allocated 18 percent of his salary to direct cost because there was no current information available to ascertain the helicopter maintenance cost. For comparative purposes, we also used 100 percent of the THA mechanic's salary as a component of direct cost. This comparison was done to show what the total cost per flight hour cost would have been had the THA mechanic spent all his time servicing the helicopter. (See Exhibit 6, page 11)

THA officials also said the THA mechanic is licensed to perform repair and maintenance work on the helicopter's basic airframe and engine. He is also certified to perform all Federal Aviation and Administration required inspections except on aircraft overhauls and on engines. According to THA officials, approximately 90 percent of the helicopter's scheduled and unscheduled repair and maintenance is performed in-house by the THA mechanic.

The helicopter has a significant number of moving parts; each having a different limited life as determined by the manufacturer. Because of the complex nature of estimating unit costs for the numerous limited life parts and their scheduled and unscheduled maintenance, we used predetermined direct cost per flight hour sample cost data contained in

Bell Helicopter Textron Corporation's Technical Information Bulletin, dated February 1993 (Bulletin). Most helicopter manufacturers provide the type of information contained in the bulletin to assist prospective owners in determining a reasonable cost of operation. Since we were able to determine that 90 percent of the scheduled and unscheduled repair and maintenance is performed in-house by the THA mechanic, 10 percent of the sample bulletin's direct labor cost per flight hour was used.

We could also isolate the amount the THA spent for fuel and labor cost associated with repairs and maintenance and performed separate calculations to compute the direct cost per flight hour for fuel and labor. Even though aircraft depreciation is considered a cost of operating the helicopter, we did not include depreciation in our cost assumptions because it does not result in an actual cash outlay.

Indirect Cost Computation

The THA spent approximately \$76,800 on indirect costs in 1993 and \$66,140 in 1992. Per the flight logs, the actual hours flown in 1993 and 1992 were 240 and 283 respectively.

Indirect cost per flight hour was derived by dividing the actual hours flown into the corresponding indirect cost:

- 1993 Indirect cost per flight hour
 $(\$76,800/240) = \$320.$

- 1992 Indirect cost per flight hour
 $(\$66,140/283) = \$234.$

Direct Cost Computations

The THA spent \$8,060 and \$6,898 on helicopter fuel in 1993 and 1992 respectively. The THA purchased fuel at an average price of \$.67 a gallon in 1993 and \$.68 per gallon in 1992. In order to determine the direct fuel cost per flight hour, we used the manufacturer estimate of 38 gallons per flight hour, as shown in the Bulletin, to calculate the total number of gallons used per year for flights. We multiplied the estimated 38 gallons per flight hour by the average price per gallon. The following is the direct cost per flight hour for fuel:

| EXHIBIT 4 Total Indirect Costs | | |
|-----------------------------------|-----------|-----------|
| | 1992 | 1993 |
| Pilot | \$ 43,902 | \$ 46,356 |
| Insurance | \$ 22,238 | \$ 30,444 |
| TOTAL | \$ 66,140 | \$ 76,800 |

Source: Toll Highway Authority

- 1993 Fuel direct cost per flight hour (38 X .67) = \$25
- 1992 Fuel direct cost per flight hour (38 X .68) = \$26

The THA allocated \$8,634 and \$8,225, which represents 18 percent of the building maintenance foreman's salary of \$47,967 for 1993 and \$45,697 for 1992 respectively, to the cost of servicing and maintaining the helicopter. Direct labor cost per flight hour for in-house repair and maintenance was derived by dividing the actual hours flown into the in-house repair and maintenance cost at both 18 and 100 percent:

Building Maintenance Foreman's Salary at 18 Percent

- 1993 Direct cost per flight hour (\$8,634/240) = \$36
- 1992 Direct cost per flight hour (\$8,225/283) = \$29

Building Maintenance Foreman's Salary at 100 Percent

- 1993 Direct cost per flight hour (\$47,967/240) = \$200
- 1992 Direct cost per flight hour (\$45,697/283) = \$162

| EXHIBIT 5 | |
|--|-----------------------------|
| Sample Direct Cost of Operations | |
| | <u>Cost Per Flight Hour</u> |
| Lubricants | \$ 1 |
| Labor (See Note) | 2 |
| <u>Basic Air Frame Maintenance</u> | |
| <u>Parts</u> | |
| Inspection | 3 |
| Overhaul | 95 |
| <u>Powerplant (engine)</u> | |
| Module parts | <u>65</u> |
| Total Direct Cost per Flight Hour | <u>\$166</u> |
| <small>Note: Labor rate assumed at \$45.00 per hour. Figure represents 10% of estimated external labor cost.</small> | |
| <small>Source: Bell Helicopter Textron Bulletin obtained from the THA</small> | |

As discussed above, another component of the direct cost is the sample direct cost. This data was obtained from the Bulletin which presented a sample of direct cost per flight hour for three main categories: Lubricants, Basic Airframe Maintenance (parts and inspections) and Powerplant(engine overhaul parts and inspection) . Per the Bulletin, the sum of the individual sample direct costs per flight hour for lubricants, basic airframe and powerplant overhaul maintenance equals \$166. This amount only includes 10 percent of the sample direct labor cost per flight hour because the THA mechanic performs 90 percent of the repair and maintenance in-house as stated above. See Exhibit 5 for the basis of this computation.

Because of the time frames associated with this inquiry, we were unable to obtain verification of all the annual flight hours assumptions contained in Exhibit 5. However, we assessed the sample cost data and determined that it appeared reasonable as a basis for estimating annual direct cost of operations per flight hour.

Total Cost Per Flight Hour

To get the total estimated cost per flight hour, we added the sample direct, indirect, and direct fuel and labor costs per flight hour. The total estimated costs per flight hour for 1993 and 1992 using 18 percent of the THA mechanic's personnel cost were \$547 and \$455 respectively. Using 100 percent for the THA mechanic's personnel cost, the total estimated cost per flight hour for 1993 and 1992 were \$711 and \$588, respectively.

The reason for the increase in cost per hour in 1993 is that the hours logged in 1993 were significantly lower than those logged in 1992. According to THA officials, the increased hours in 1992 were due to on-going construction projects.

Cost Reimbursement

We were unable to determine if there were any flights of a personal or otherwise non-official purpose for which the THA should have received reimbursement for costs. As stated earlier, THA does not maintain complete documentation for the reason or purpose for every flight. According to THA officials, all helicopter flights taken by THA personnel are of an official nature and those undertaken by THA personnel relate to THA business.

User Charges and Other Carrier Charge Comparison

The Governor uses the helicopter for both official and non-official purposes and is the only user that reimburses the THA for flight costs. THA charges \$400 per flight hour for both the official and non-official business use of the helicopter. THA does not charge State Police for their use of the helicopter. According to THA officials, the only other times the helicopter is used by other state agencies, except the State Police, are for emergency reasons, and they do not charge for emergencies.

We contacted the Department of Transportation (DOT) and determined it charges \$84 per person/per flight hour for use of its helicopter. The DOT determined its cost per flight hour by using current payments made for both direct and indirect costs instead of using actual costs incurred, which would include an allowance for maintenance and other future expenses based on usage. THA officials stated that the closest DOT helicopter is located in Peoria, which is too far to access in the event of an emergency.

EXHIBIT 6
Estimated Cost per Flight Hour

| | <u>1993</u> | | <u>1992</u> | |
|--|---|-----------------------------|----------------------------|-----------------------------|
| | (at 18% Estimated Personnel Cost) | (at 100% Personnel Cost) | (at 18% Personnel Cost) | (at 100% Personnel Cost) |
| Actual Hrs. Logged Per Year (a) | 240 | | 283 | |
| Total Indirect Cost (b) | \$ 76,800 | | \$ 66,140 | |
| Indirect Cost/ Per Flt. Hour (b / a) | \$ 320 | | \$ 234 | |
| Fuel Cost/ Per Flt. Hour | 25 | | 26 | |
| THA Personnel Cost/ Per Flt. Hour: | | | | |
| at 18% | 36 | | 29 | |
| at 100% | | 200 | | 162 |
| Estimated Parts & External Maintenance Cost/ Per Flt. Hour | <u>\$ 166</u> | <u>\$ 166</u> | <u>\$ 166</u> | <u>\$ 166</u> |
| Total Estimated Cost Per Flt. Hour | <u>\$ 547</u> | <u>\$ 711</u> | <u>\$ 455</u> | <u>\$ 588</u> |
| Charge Per Flt. Hour | <u>(400)</u> | <u>(400)</u> | <u>(400)</u> | <u>(400)</u> |
| Estimated Per Flt.Hr. Cost Not Covered | <u>\$ 147</u> | <u>\$ 311</u> | <u>\$ 55</u> | <u>\$ 188</u> |

Source: OAG Analysis of Toll Highway Authority Documents

We also compared the \$400 per flight hour charges to public and private carriers. We completed a telephone survey of 11 aviation transportation companies. Four of these rented helicopters. Prices ranged from as low as \$500 per flight hour for aircraft with a four passenger capacity to as high as \$2,500 per flight hour with a six passenger capacity. Of the four helicopter carriers contacted, only one had an aircraft with a six passenger capacity. According to this carrier, their Sikorsky S-76 helicopter is similar in size to the 206L4 model used by the THA. This carrier charges \$2,500 per flight hour regardless of the number of passengers aboard.

In our review of 1992 and 1993 THA helicopter flight data, all passengers flown between THA headquarters in suburban Chicago and Springfield were THA executive staff. We compared costs of airplane flights between Chicago and Springfield. Small airplane flight rates, rented from private companies, between Chicago and Springfield ranged from \$435 to \$1787.50. Commercial airline rates varied and round trip fares ranged from \$198 to \$280 per person.

Costs Exceed Charges

According to THA officials, the precedent for the \$400 per hour charge was started when Governor Thompson used the helicopter and requested that a study be performed to determine a reasonable charge. The Governor's office voluntarily requested that the Governor reimburse the THA for flight costs. While THA officials stated that a study was performed, they could not provide any documentation to support the \$400 cost per flight hour.

While the THA charges \$400 per flight hour for both the official and non-official trips, their estimated current costs per flight hour exceed that amount. As seen in Exhibit 6, the total estimated costs per flight hour in 1993 were \$547 and \$455 in 1992 when using 18 percent for the THA mechanic's personnel cost. The estimated cost per flight hour not covered by the \$400 charge is \$147 in 1993 and \$55 in 1992. Using 100 percent of the THA mechanic's personnel cost, total estimated costs per flight hour were \$711 in 1993 and \$588 in 1992. The estimated cost per flight hour not covered by the THA \$400 charge is \$311 in 1993 and \$188 in 1992. These costs are significantly greater because the costs per flight hour for THA personnel at 100 percent were \$200 and \$162 in 1993 and 1992 respectively.

THA officials have not evaluated the fiscal soundness of the \$400 per flight hour charge they established for the former Governor. Furthermore, the THA has not differentiated between the rate charged for official versus non-official business use.

THA officials also have not analyzed the cost-effectiveness of their air operation and examined whether alternate means exist to fulfill their travel needs. They have not performed any cost-benefit analyses or other studies. However, one THA official stated that

one time he conducted a telephone survey to determine how much it would cost to rent a helicopter and determined that the cost to rent a helicopter per hour was greater than their cost to operate their own. As stated previously, the THA could not provide documentation to support the 18 percent helicopter cost allocation of the THA mechanic's salary. Maintenance of the helicopter is an important component of the cost of operation.

RECOMMENDATION NUMBER 2

Toll Highway Authority officials should conduct a cost-effectiveness study on the use of their helicopter. They should maintain adequate documentation to support allocations of costs attributable to the operation of the helicopter. They should also review and revise the rates charged for passengers using their helicopter.

OTHER STATES SURVEY

We identified and conducted a telephone survey of nine other state tollway authorities or commissions. These nine other authorities or commissions were identified as having similar type operations to the THA in Illinois in that they are independently functioning bodies and not associated with the state transportation department and have at least 100 miles of operating toll roads. These nine authorities or commissions are located in New Jersey (2), Maine, Kansas, Ohio, Pennsylvania, Massachusetts, New York, and Oklahoma. They are:

- New Jersey Highway Authority
- New Jersey Turnpike Authority
- Maine Turnpike Authority
- Kansas Turnpike Authority
- Ohio Turnpike Commission
- Pennsylvania Turnpike Commission
- Massachusetts Turnpike Authority
- New York State Thruway Authority
- Oklahoma Turnpike Authority

None of the other authorities or commissions we contacted owned their own helicopter. Four used their State Police helicopters on occasion, but were not charged for the use of the craft. These commissions or authorities are paying the state troopers to monitor their tollways, but in each of these cases, the use of the helicopters was not paid for

separately. They used the helicopters for traffic surveillance, traffic surveys, and to check construction. According to the officials, the use has been very infrequent, ranging from once or twice a month to once or twice in the past few years. One of these four authorities leased a private helicopter twice several years ago and said they paid \$350 an hour for a small helicopter and \$550 an hour for a large helicopter. Another authority official stated they inquired about renting a helicopter, but it was too expensive at \$700 to \$1,000 an hour and they checked into getting their own helicopter but determined it was not cost-effective for them.

One of the authorities or commissions leased a private helicopter 2-4 times during construction in 1990-1992 but hasn't used one since. The other four authorities or commissions stated they have never used a helicopter.

Four of the nine authorities have used small airplanes on occasion. One of these uses the State Police airplane once or twice a year to fly their photographer. One formerly used the police airplane less than once a year for pictures of construction but hasn't used it in the last 4-5 years. Another leased a small private airplane in the 1980's for some aerial photography, but couldn't provide cost information. Another leases the State Government airplane about 4 times a year for \$600-\$800 a day.

REPORT SUMMARY

THA currently owns and operates their third helicopter, which was purchased in 1993. The helicopter hours logged according to the flight logs in 1992 totaled 283 and 240 in 1993. According to THA officials, the increased hours in 1992 were due to on-going construction projects.

The primary users of the helicopter are THA departments and officials, the Governor, and the State Police. The helicopter uses include videos and photographs of construction projects, transporting officials to meetings, various police matters, and emergencies. The THA administrative category had the highest percentage usage in 1992 and 1993.

The total estimated costs per flight hour were \$547 in 1993 and \$455 in 1992 when allocating 18 percent of the THA building maintenance foreman's salary to direct cost. The total estimated costs per flight hour were \$711 in 1993 and \$588 in 1992 when a 100 percent of the THA building maintenance foreman's salary was used. These costs are higher than the \$400 per flight hour rate charged for both the official and non-official business use of the helicopter. The Governor is the only user charged for the use of the helicopter. The Governor's office voluntarily pays for the use of the aircraft, according to THA officials.

THA did not maintain documentation of the reason and purpose for all trips. Therefore, we could not determine if the helicopter was used for personal reasons.

We contacted nine other state tollway authorities and commissions and found that none of them owned a helicopter. Four used their state police helicopter on occasion but were not charged for it. Their usage ranges from once or twice a month to once or twice in the past few years. Another leased a helicopter 2-4 times several years ago. The other four have not used a helicopter.

THA officials have not analyzed the cost-effectiveness of their air operation. They have not conducted cost-benefit analyses or other studies to determine alternate methods to meet their travel needs.



APPENDIX A

RESOLUTION NO. 100
Presented by Representative Hannig

WHEREAS, recent media reports have detailed the operation and utilization of helicopter flights by personnel of the Illinois State Toll Highway Authority; and

WHEREAS, the Illinois Department of Transportation already has four State-owned planes and one State helicopter; and

WHEREAS, the Illinois State Tollway Authority operates with taxpayers money; now

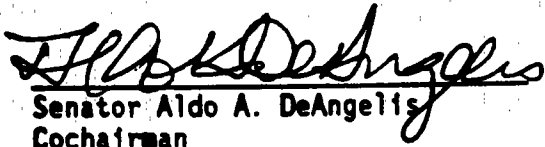
THEREFORE BE IT RESOLVED by the Legislative Audit Commission of the State of Illinois that the Auditor General is directed to conduct a special inquiry regarding the utilization of helicopter flights by the Illinois State Toll Highway Authority and report his findings to the Legislative Audit Commission as soon as possible, but no later than May 15, 1994.

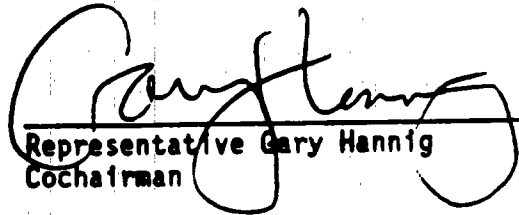
BE IT FURTHER RESOLVED that this special inquiry shall include but need not be limited to the following determinations:

- 1) A determination of the type of equipment utilized for such flights, including the date purchased and hours logged;
- 2) A determination of the costs associated with such flights;
- 3) A determination of the recorded users of such flights and the recorded numbers, times, and purposes of the flights by each user according to Authority records;
- 4) An examination of other comparable toll highway authorities' use of such transportation;
- 5) A determination of the number and percentage of flights used for:
 - emergency
 - engineering and planning
 - administrative (Toll Highway)
 - administrative (other, State agencies)
 - other;
- 6) A determination of whether the Toll Highway received reimbursement for costs incurred for flights of a personal or otherwise non-official purpose;
- 7) A determination of whether the per mile charge is sufficient to cover the costs incurred and how the per mile charge compares with those of private or public air transportation; and

- 8) A determination of whether the Toll Highway has analyzed the cost-effectiveness of its air operation and examined whether alternate means exist to fulfill its travel needs (such as leasing aircraft or using private or public commercial aircraft on an as needed basis).

Adopted this 3rd day of March, 1994.


Senator Aldo A. DeAngelis
Cochairman

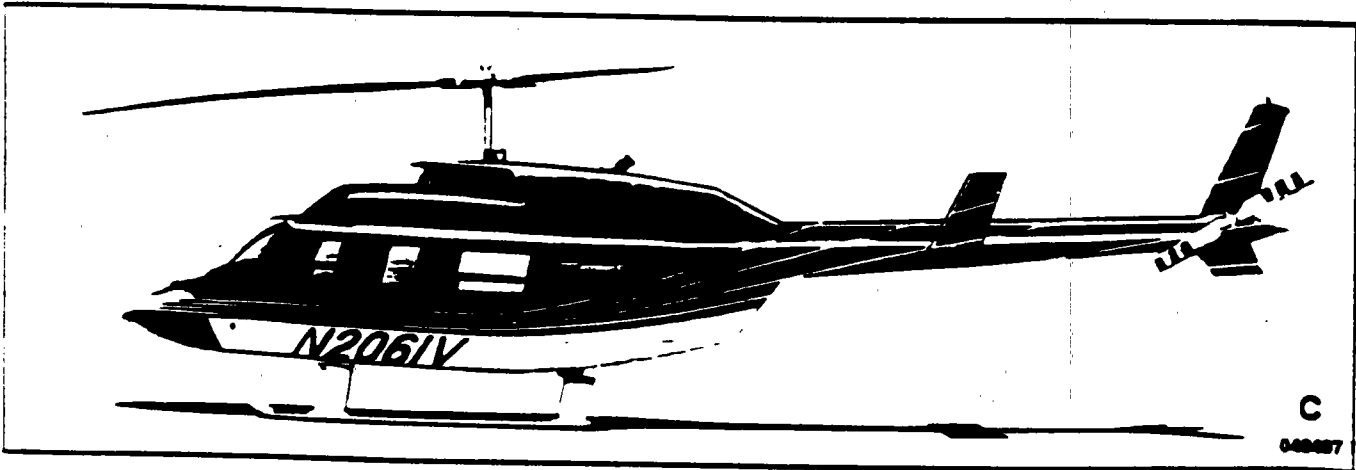
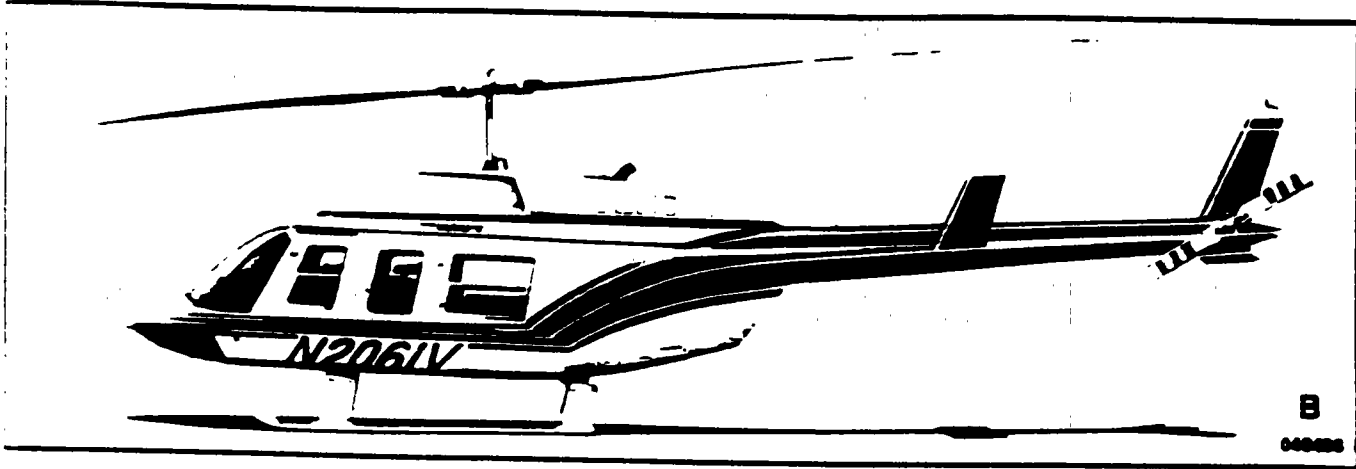
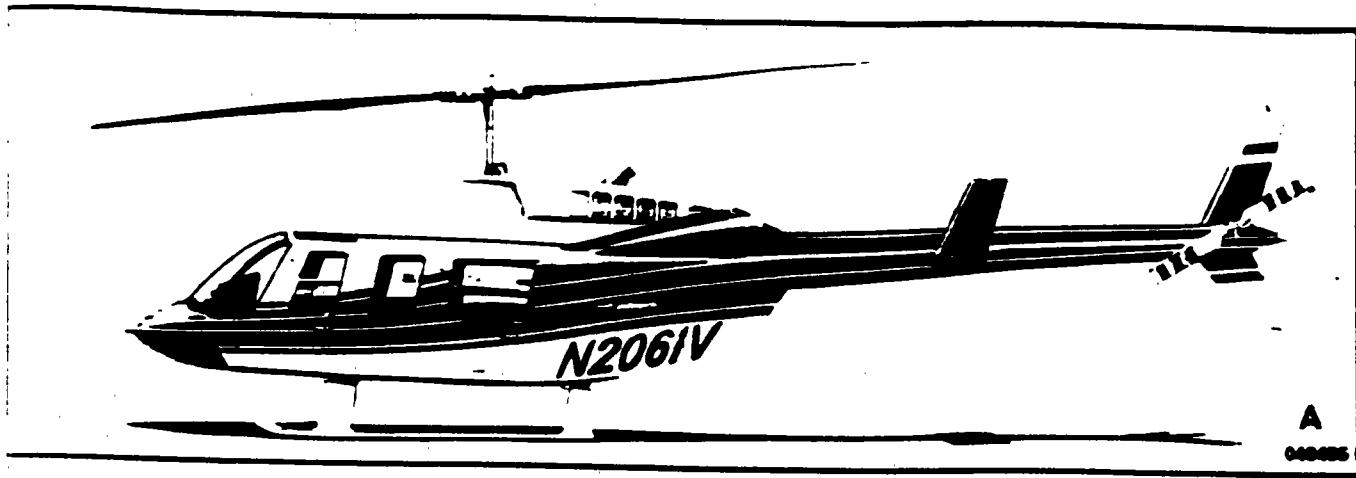

Representative Gary Hannig
Cochairman


Representative Margaret Parcels
Secretary

APPENDIX B

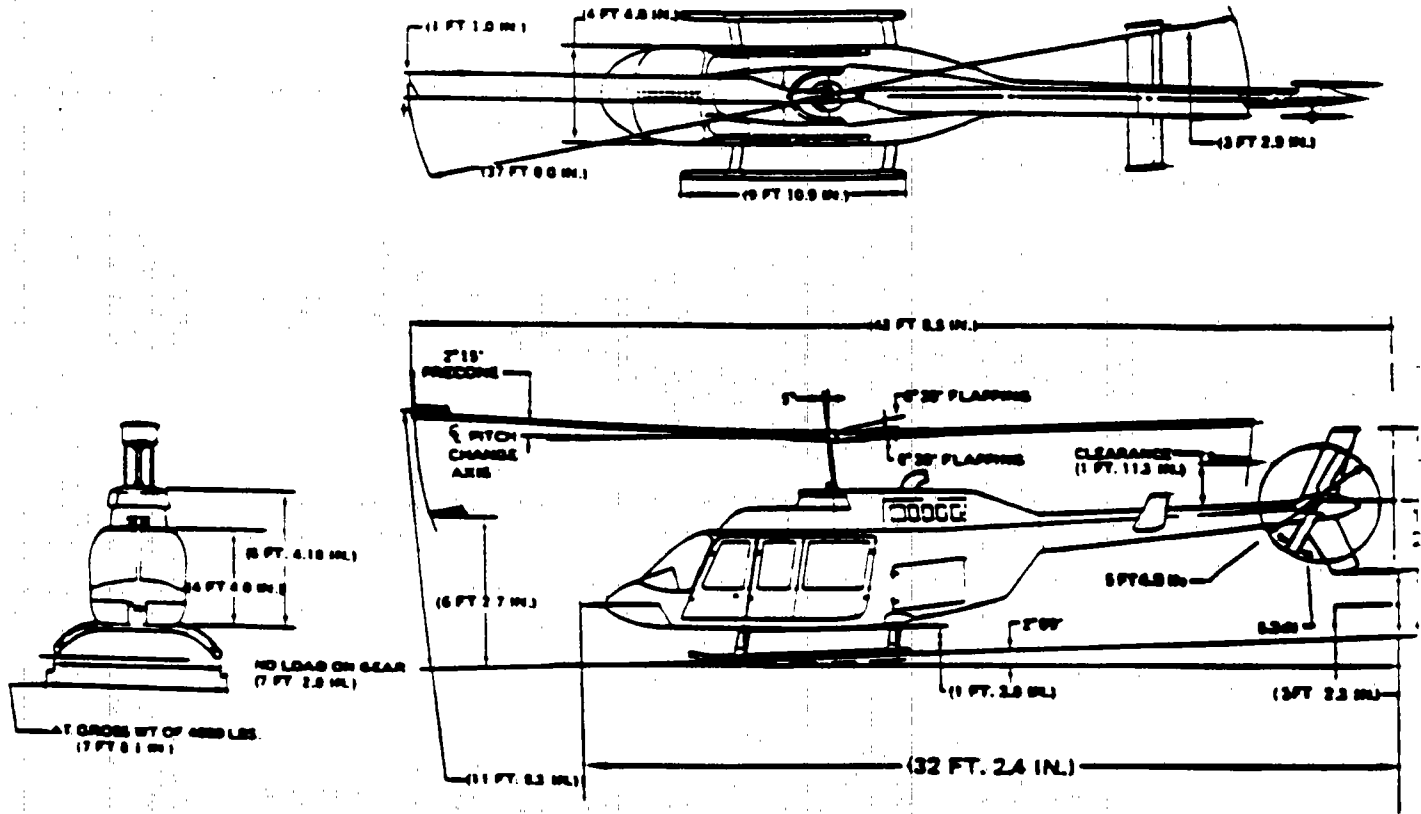
BELL 206L-4 *LongRanger IV*

7-Place • Turbine Powered • Light Utility/Corporate Helicopter



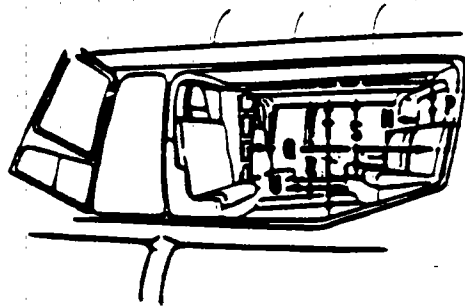
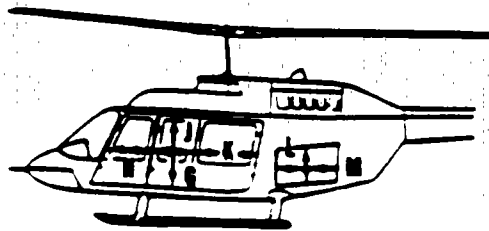
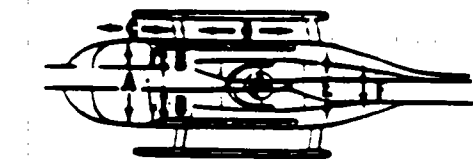
Technical Information
FEBRUARY 1993

Bell Helicopter **TEXTRON**
A Subsidiary of Textron Inc.



THREE COLOR DUPONT POLYURETHANE FINISH APPLIED PER SHT STANDARD PAINT SCHEMES INCLUDED IN LIST PRICE. SPECIAL PAINT SCHEMES QUOTED ON REQUEST.

Interior Dimensions



| | | Feet |
|----|--|------|
| A. | Forward cabin width | 4.2 |
| B. | Forward seat width | 1.4 |
| C. | Forward seat and leg room | 3.7 |
| D. | Aft seats and leg room | 5.3 |
| E. | Baggage compartment depth forward | 3.8 |
| F. | Baggage compartment depth aft | 1.3 |
| G. | Door height | 3.4 |
| H. | Front door width | 2 |
| J. | Center door width | 2.1 |
| K. | Aft door width | 3 |
| L. | Baggage compartment width | 3.1 |
| M. | Baggage compartment height | 1.8 |
| N. | Parcel shelf depth | 1 |
| P. | Parcel shelf height | 1.3 |
| Q. | Cabin length | 4.7 |
| R. | Cabin height from tunnel to roof | 3.7 |
| S. | Cabin height from seat support to roof | 3.4 |
| T. | Cabin height floor to roof | 4.2 |
| U. | Cabin floor length | 2.1 |

APPENDIX C

FLIGHTS AND HOURS BY PASSENGERS

| | <u>Flights</u> | | <u>Passengers</u> | | <u>Hours</u> | |
|---|----------------|-------------|-------------------|-------------|--------------|--------------|
| | <u>1992</u> | <u>1993</u> | <u>1992</u> | <u>1993</u> | <u>1992</u> | <u>1993</u> |
| Emergency | 2 | 4 | 3 | 9 | 8.8 | 3.1 |
| Engineering | 75 | 33 | 100 | 49 | 107.4 | 49.4 |
| Administration - THA | 62 | 66 | 98 | 99 | 76.5 | 108.5 |
| Administration - Other State Agencies | 49 | 32 | 144 | 122 | 48.9 | 37.0 |
| THA Test Flights/Other | 43 | 28 | - | 7 | 23.4 | 16.3 |
| Other (Gov. Non-Official) | <u>10</u> | <u>16</u> | <u>38</u> | <u>54</u> | <u>18.1</u> | <u>26.0</u> |
| TOTAL | <u>242</u> | <u>179</u> | <u>383</u> | <u>340</u> | <u>283.1</u> | <u>240.3</u> |

Note: In compiling the above statistics, we defined flights as trips for which a flight itinerary exists.

APPENDIX D

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

DAILY AVIATION MISSION REPORT

| DATE | AIRCRAFT | | MODEL | PRE FLIGHT TACH | | | |
|--------|-----------|-------------|--------|-----------------|----------|-------------|-------------|
| | PILOT NO. | PASSENGERS | | MISSION | DEPT. | SP. READING | BLOCK HOURS |
| | | LOCATION | TIME | LDG | | | |
| 3-5-92 | N-1877W | A-75 | 2066-3 | 1080.8 | | | |
| | | FROM CA | | | | | |
| KA | 921 | STY E-W MAW | 1100 | 1152 | PHOTO | ENV | 1081.7 |
| KA | - | CA MAW | 1210 | 1240 | MAINT | ENV | 1082.1 |
| KA | - | MAW CA | 1258 | 1310 | MAINT | ENV | 1082.3 |
| KA | 921 | WSTY MAW CA | 1410 | 1500 | PHOTO | ENV | 1083.3 |
| KA | - | CCX | 1640 | 1700 | SP/KANS | EX | 1083.5 |
| KA | Gov + 3 | OAK BROOK | 1750 | 1805 | Gov/KANS | EX | 1083.8 |
| KA | Gov + 2 | MAW | 2135 | 2150 | Gov/KANS | EX | 1084.2 |
| KA | - | CA | 2155 | 2210 | Gov/KANS | EX | 1084.4 |
| | | | | | | | 3.6 |

APPENDIX E

**ILLINOIS STATE TOLL HIGHWAY AUTHORITY'S
RESPONSE
AND AUDITOR'S COMMENTS**



The Illinois State Toll Highway Authority
One Authority Drive
Downers Grove, Illinois 60515-1703
708 / 241-6800
Fax: 708 / 241-6100
T.D.D. 708 / 241-6898

June 10, 1994

REC-111
AUDITOR GENERAL
SPFLD.
'94 JUN 13 PM 2 13

Mr. William G. Holland
Auditor General
Office of the Auditor General
509 South Sixth Street
Room 151
Springfield, IL 62701-1878

Dear Mr. Holland:

An audit of helicopter costs was conducted in late May and early June of this year by the Internal Audit Section of The Illinois State Toll Highway Authority. They obtained the Daily Aviation Mission Reports, Daily Helicopter Log Reports and the Helicopter Flight Requests for 1990, 1991, 1992 and 1993 after their review by your agency and the Illinois State Police. The Helicopter Log Reports are sequentially numbered. They listed the missing log reports as reported in your report, and vouchered them to the Pilot's Federal Aviation Administration Flight Logs. All log reports were accounted for.

(See Note)

The General Ledger for 1993 was analyzed to obtain the costs associated with the operation of the helicopter. Based upon their review, they were unable to determine all of the various expenses charged to the helicopter. They obtained the 1994 Budget for the helicopter costs from the Physical Services Department. They also obtained the Direct Operating Cost Estimates of the Technical Bulletin published by the Bell Helicopter Textron Corporation. They called Mr. Brandon Battles of Texas who published this report for further clarification of the individual line items.

They interviewed the helicopter pilot and mechanic in addition to the Manager of the Physical Services Department.

In an effort to obtain the cost per flight hour, they compiled data based upon the Bell Helicopter Operating Cost Estimates and the General Ledger costs for Pilot and Mechanic salaries and the insurance costs.

NOTE: See Auditor's Comments, Page 43

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The Illinois Tollway paid for by toll revenue not Federal or State tax dollars.

Mr. William G. Holland
June 10, 1994
Page Two

It should be noted that the Authority's cost for aviation fuel is \$0.67 per gallon, whereas the Bell Helicopter Bulletin used \$1.50. The Authority's mechanic labor is \$23.00 per hour vs. the Bell Helicopter Bulletin of \$45.00 per hour. Please see Exhibit 1 for the 206L-4 Helicopter.

The Helicopter Cost Estimates per Flight Hour based on 240 flight hours (Exhibit 2) compares to the Auditor General's Helicopter Special Inquiry of June 1994 on Page 11, Exhibit 6. The Auditor General's Exhibit 6 used \$41.85 for Unscheduled and on-condition parts. The Authority bases the Unscheduled and on-condition parts cost at \$10.00 per hour based upon a discussion with Mr. Brandon Battles of the Bell Helicopter Corporation in which he stated that due to the corrosive nature created by the salt water conditions in the Gulf of Mexico, certain helicopter parts will deteriorate more quickly, thus requiring more frequent replacements. The helicopters that service the oil platforms in the Gulf of Mexico are a significant portion of the Bell Helicopter Corporation revenue.

Exhibit 3 contains the same cost calculations for 250 flight hours as Exhibit 2 does for 240 flight hours. Exhibit 4 contains a comparison of cost per flight hour for 200, 250, 300, and 350 hours. The variable or direct costs are increased according to the number of hours flown while the fixed or indirect costs remain the same. However, the more hours that are flown, the less cost per flight hour as shown in Exhibit 4.

District 15 of the Illinois State Police provides law enforcement for the Illinois State Toll Highway Authority and is entirely funded by the Authority. At various times throughout the year, District 15 will use the helicopter for missions such as: providing assistance in traffic control for major accidents in which traffic has to be routed off the tollway, provide security for crowd control (World Cup Soccer Match), assistance in man-hunts, etc. The Governor's Office also uses the helicopter occasionally, and these costs will be billed to the Governor's cost center. Local police agencies contact us in case of emergencies such as kidnappings, missing persons, drowning, etc. These costs will be billed against the Illinois State Police cost center.

Resolution No. 13951, please see Exhibit 6, authorizes the hiring of a pilot for the helicopter. His salary for 1994 is \$45,177 with an upper limit of compensation of \$60,000.00. The helicopter pilot is paid straight time and accumulates Earned Time Off (ETO) for hours having worked over the normal work day. The ETO is utilized by the helicopter pilot at the Authority's discretion.

Mr. William G. Holland
June 10, 1994
Page Three

The flight hours estimated for calendar year 1994 are 310. This relates to an overall estimated operating cost of \$434.00 per hour. In January of each year, the actual cost of the preceding year will be calculated and used for the ensuing twelve months. The same procedure will be used in billing the Governor for his usage. The most usage of our helicopter comes during construction season, normally May through mid-November.

Flight usage of the helicopter is documented on three forms; the Helicopter Request Form, Daily Mission Report and the Bell Helicopter Log, and signed by the pilot. These forms indicate the passengers by cost center, destinations and purpose of trip. Exhibit No. 5 provides an explanation of the reports and samples.

The following actions are implemented, or will be implemented, starting June 18, 1994 in an effort to identify and apply all costs to the Helicopter Section and allows us to analyze our cost effectiveness.

- A policy has been implemented prohibiting the use of the helicopter for transportation or personal use except in the case of an extreme emergency, and requires the approval of the Executive Director and/or the Chairman.
- A program has been implemented that charges all aviation fuel used, (including outside purchases) to the helicopter cost center.
- A separate cost center will be established for the helicopter costs. At present, helicopter costs are charged to Physical Services. Physical Services will add the helicopter center to its existing cost centers: Carpenter Shop, Physical Services-Administration, Building Inspection, CA Maintenance, Custodial Services and Motor Pool.
- A work order system will be established for all aviation repairs, maintenance, and mechanic costs. These aviation cost work orders would be applied to the helicopter M-number, the same as Service Repair Orders are applied to the trucks or cars of the Authority.
- The cost of the flight will be charged to appropriate Department cost center or the Governor's Office.

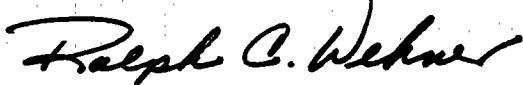
Mr. William G. Holland
June 10, 1994
Page Four

- The Physical Services Department will input the sequentially numbered Helicopter Logs and the Helicopter Flight Manifests to the Helicopter Cost Center. They will list the passengers, destination, purpose of the flight and flight hours. Any voided Helicopter Logs will be retained.
- A printout summarizing the helicopter usage will be sent on a monthly basis to the Executive Director.

In conclusion, I believe the actions implemented, or that will be implemented as of June 18 by the Authority, address the two recommendations in your Report on the "Helicopter Special Inquiry" of June, 1994. If you have any further questions or desire clarification, we would be pleased to meet with you and/or your staff.

Thank you for the opportunity to review and comment on your Audit Report.

Very truly yours,



Ralph C. Wehner, P.E.
Executive Director

tas/RCW

cc: Chairman John P. Garrow

Focusing on DOCs

difficult to believe but another year has passed and it's time to publish the 1994 DOC estimates. (See below.) The '94 estimates have increased slightly, no more than 4%, over '93. The estimates have increased less than previous years due to Bell's continuing effort to identify areas for product improvement and the average spare parts price increase of 1.5%. (No part increased more than 1.9% and several thousand decreased.)

Since the last issue of *Rotorbreeze*, I have received several questions about our published maintenance-man-hour-per-flight-hour (MMH/FH) and what it represents. I have discussed the subject in a past issue of *Rotorbreeze* but apparently did not do a good job. So, I will try again.

Our published number attempts to represent the "actual" maintenance time a maintenance person spends working on the helicopter. In other words, a number that fits between two extremes.

To describe the first extreme, I will use two terms I have heard, "ideal" or "hands

on" time. For example, Bell used to conduct Management Engineering Analyses (MEAs) which studied and timed maintenance personnel while performing various tasks. Obviously, due to perfect conditions and the ideal preparation and experience of the maintenance personnel, the time estimates could reflect more than optimistic results. Although optimistic, the estimates did establish a good baseline.

The second extreme involves comments I have heard from operators. In most cases, operators refer to MMH/FH as the amount of time the company pays the maintenance person. To use a simple example, if the mechanic worked an eight-hour shift and the helicopter flew one hour, then the operator would consider the MMH/FH to be eight, even if the maintenance person worked on other tasks not associated with the helicopter.

For good reason, the operator is primarily concerned with the amount of time they must pay the maintenance person. Actual time spent on the helicopter is not the top concern.

However, that is not the extreme Bell wants in its published estimates. We want an estimate between both extremes.

an estimate that reflects "actual" time spent maintaining the aircraft.

Many service organizations in other industries use a term *billable hours*. For example, if a lawyer works four hours for a client and four more hours on general work for the firm, the client's job receives a charge of four hours, not eight. During the four hours, the lawyer may consult legal texts, stop for a break, or consult with someone about the client but the time is still billed to the client.

We want our published estimates to reflect the same average "actual" time as illustrated above.

If you have other questions about our new 1994 DOC estimates or other general questions, please do not hesitate to contact me.

1994 DIRECT OPERATING COST ESTIMATES

| | 206B-3 | 206L-4 | 206Twin | 230 | 212 | 412 |
|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Fuel and Lubricants (Note 1) | \$43.26 | \$58.71 | \$74.16 | \$128.24 | \$139.05 | \$174.59 |
| Airframe Direct Maintenance | | | | | | |
| Labor (Note 2) | | | | | | |
| Inspection | 7.47 | 8.37 | 9.50 | 14.49 | 17.28 | 18.14 |
| Overhaul | 4.50 | 4.37 | 5.63 | 2.79 | 4.95 | 4.64 |
| Unscheduled and on-condition | 16.70 | 17.10 | 21.15 | 34.56 | 20.21 | 20.16 |
| SUB TOTAL | 28.67 | 29.84 | 36.28 | 51.84 | 42.44 | 42.94 |
| Parts | | | | | | |
| Inspections | 2.67 | 1.77 | 1.74 | 1.54 | 4.07 | 15.86 |
| Overhaul | 10.17 | 14.06 | 20.35 | 14.15 | 25.90 | 25.90 |
| Retirement | 26.41 | 42.47 | 42.48 | 80.22 | 48.59 | 83.82 |
| Unscheduled and on-condition | 27.73 | 41.85 | 51.37 | 79.84 | 67.10 | 130.04 |
| SUB TOTAL | 66.98 | 100.15 | 115.94 | 175.75 | 145.66 | 254.82 |
| Powerplant Direct Maintenance | | | | | | |
| Module and accessory exchange | 47.90 | 58.02 | 110.74 | 118.68 | 128.47 | 128.47 |
| Line Maintenance | 3.00 | 3.00 | 6.00 | 6.00 | 15.07 | 15.07 |
| Total Average Cost per Flight Hour | \$189.81 | \$249.72 | \$343.12 | \$480.51 | \$470.69 | \$615.89 |

NOTES: (1) Fuel at \$1.50 per gallon. Lubricants at 3% of fuel cost per hour.
(2) Assumed labor rate, \$45.00 per hour.

**ILLINOIS STATE TOLL HIGHWAY AUTHORITY
HELICOPTER COST ESTIMATES PER FLIGHT HOUR
BASED ON 240 FLIGHT HOURS**

DIRECT COSTS

| | |
|------------|-----------|
| Fuel | \$25.46 * |
| Lubricants | \$1.00 |

AIRFRAME DIRECT MAINTENANCE

| | |
|------------------------------|-------------------|
| Parts: | |
| Inspection | \$1.77 |
| Overhaul | \$14.06 |
| Retirement | \$42.47 |
| Unscheduled and On-Condition | <u>\$10.00 **</u> |
| | \$68.30 |

POWERPLANT MAINTENANCE

| | |
|-------------------------------|-------------------|
| Module and accessory exchange | \$58.02 |
| Line Maintenance | <u>\$1.50 ***</u> |
| | \$59.52 |

| | |
|-----------------------------------|---------|
| Mechanic (\$8,895/240 base hours) | \$37.06 |
|-----------------------------------|---------|

| | |
|---------------------------|------------------------|
| TOTAL DIRECT COSTS | <u>\$191.34</u> |
|---------------------------|------------------------|

INDIRECT COSTS

| | |
|-------------------------------------|----------|
| Pilot (\$45,177/240 base hours) | \$188.24 |
| Insurance (\$32,258/240 base hours) | \$134.41 |

| | |
|-----------------------------|------------------------|
| TOTAL INDIRECT COSTS | <u>\$322.65</u> |
|-----------------------------|------------------------|

| | |
|--|------------------------|
| TOTAL EST. COST PER FLIGHT HOUR | <u>\$513.99</u> |
|--|------------------------|

- * Fuel usage is 38 gallons per flight hour.
- ** Authority's cost lower than published amount per past experience & location of operation.
- *** Authority's cost lower than published amount due to in-house mechanic.

NOTE: See Auditor's Comments, Page 43

Exhibit 2

**ILLINOIS STATE TOLL HIGHWAY AUTHORITY
HELICOPTER COST ESTIMATES PER FLIGHT HOUR
BASED ON 250 FLIGHT HOURS**

DIRECT COSTS

| | |
|------------|-----------|
| Fuel | \$25.46 * |
| Lubricants | \$1.00 |

AIRFRAME DIRECT MAINTENANCE

| | |
|------------------------------|------------|
| Parts: | |
| Inspection | \$1.77 |
| Overhaul | \$14.06 |
| Retirement | \$42.47 |
| Unscheduled and On-Condition | \$10.00 ** |
| | \$68.30 |

POWERPLANT MAINTENANCE

| | |
|----------------------------------|------------|
| Module and accessory exchange | \$58.02 |
| Line Maintenance | \$1.50 *** |
| | \$59.52 |
| Mechanic (\$8895/250 base hours) | \$35.58 |

| | |
|---------------------------|-----------------|
| TOTAL DIRECT COSTS | \$189.86 |
|---------------------------|-----------------|

INDIRECT COSTS

| | |
|-------------------------------------|----------|
| Pilot (\$45,177/250 base hours) | \$180.71 |
| Insurance (\$32,258/250 base hours) | \$129.03 |

| | |
|-----------------------------|-----------------|
| TOTAL INDIRECT COSTS | \$309.74 |
|-----------------------------|-----------------|

| | |
|--|-----------------|
| TOTAL EST. COST PER FLIGHT HOUR | \$499.60 |
|--|-----------------|

* Fuel usage is 38 gallons per flight hour.

** Authority's cost lower than published amount per past experience & location of operation.

*** Authority's cost lower than published amount due to in-house mechanic.

**ILLINOIS STATE TOLL HIGHWAY AUTHORITY
HELICOPTER COST ESTIMATES**

| Cost Description | Annual Flight Hours | | | |
|------------------------------------|---------------------|---------------------|---------------------|---------------------|
| | 200 Hours | 250 Hours | 300 Hours | 350 Hours |
| <u>DIRECT COSTS :</u> | | | | |
| Fuel | \$5,092.00 | \$6,365.00 | \$7,638.00 | \$8,911.00 |
| Lubricants | 200.00 | 250.00 | 300.00 | 350.00 |
| Airframe direct maintenance | | | | |
| Parts: | | | | |
| Inspection | 354.00 | 442.50 | 531.00 | 619.50 |
| Overhaul | 2,812.00 | 3,515.00 | 4,218.00 | 4,921.00 |
| Retirement | 8,494.00 | 10,617.50 | 12,741.00 | 14,864.50 |
| Unscheduled and On-Condition | 2,000.00 | 2,500.00 | 3,000.00 | 3,500.00 |
| SUB-TOTAL | <u>\$13,660.00</u> | <u>\$17,075.00</u> | <u>\$20,490.00</u> | <u>\$23,905.00</u> |
| Powerplant Maintenance | | | | |
| Module and accessory exchange | 11,604.00 | 14,505.00 | 17,406.00 | 20,307.00 |
| Line Maintenance | 300.00 | 375.00 | 450.00 | 525.00 |
| SUB-TOTAL | <u>\$11,904.00</u> | <u>\$14,880.00</u> | <u>\$17,856.00</u> | <u>\$20,832.00</u> |
| Mechanic (18%) | 8,895.00 * | 8,895.00 * | 8,895.00 * | 8,895.00 * |
| TOTAL DIRECT COSTS | <u>\$39,751.00</u> | <u>\$47,465.00</u> | <u>\$55,179.00</u> | <u>\$62,893.00</u> |
| <u>INDIRECT COSTS :</u> | | | | |
| Pilot | 45,177.00 | 45,177.00 | 45,177.00 | 45,177.00 |
| Insurance | 32,258.00 | 32,258.00 | 32,258.00 | 32,258.00 |
| TOTAL INDIRECT COSTS | <u>\$77,435.00</u> | <u>\$77,435.00</u> | <u>\$77,435.00</u> | <u>\$77,435.00</u> |
| TOTAL ESTIMATED COST | <u>\$117,186.00</u> | <u>\$124,900.00</u> | <u>\$132,614.00</u> | <u>\$140,328.00</u> |
| EST COST PER FLIGHT HOUR | \$585.93 | \$499.60 | \$442.05 | \$400.94 |

* Mechanic cost is variable but \$8,895 is our best estimate.

HELICOPTER DOCUMENTATION

The following is an explanation of the 3 forms the Illinois State Toll Highway Authority uses for all flights of the Tollway helicopter. The forms are labeled:

- A. The Helicopter Request Form
- B. Daily Mission Report
- C. Bell Helicopter Log

FORM A - THE HELICOPTER REQUEST FORM

This form is filled out by the requesting department and must be authorized by the Department Head. It must include the date, time of departure and return, destination, reason for flight, passenger name and/or radio number must be approved by the Chief of the Physical Services Department. A copy is sent to the pilot for scheduling and the original is retained until after the flight. It is then filed with forms B & C.

FORM B - DAILY AVIATION MISSION REPORT

This is a two (2) copy form that the pilot uses in the helicopter after the flight has been approved. The size has been reduced for safety reasons due to the limited space in the cockpit.

Line 1 lists the date, the aircraft "N" number, the Tollway and State Police radio call sign, and the starting tachometer time in hours and tenths of hours.

Line 2 lists the pilots initials and the passengers names or radio call signs for billing purposes. Also listed is the location from and to for each leg of the flight, take off time, landing time, reason for the flight, department the flight will be charged to, and the total block flight time for each leg of the flight. The last line will also show the tach time to be carried over to the next mission report.

Line 3 lists the accumulated flight time for the day. If the flight was at night, it will also show the total night hours and the number of night landings.

Line 4 lists the pounds of fuel carried over from the previous day, the amount of oil in quarts in the helicopter, the person who made the inspection of the amount and how much fuel in pounds is added. The total fuel onboard in pounds and the cost if purchased away from the Central Administration Building, plus if fueled at the Administration Building, the person who fueled the aircraft is listed..

Line 5 lists any aircraft discrepancies, who made them and what was done to correct them.

The first copy is turned into the Physical Services Department and is attached to forms A & C. The using department is charged for the flight and the copies are filed. At the end of each month a summary is compiled for the month showing the total time used by each department, the percent of the total time used by each department and the percent of the total time. The same is done for the year. The second copy is retained by the pilot for his records.

FORM C - BELL HELICOPTER FLIGHT LOG

This is a two copy self-carbon form in numerical order. These forms are printed by and purchased from Bell Helicopter Textron, Inc. Filling out this form is mandatory per FAA rules and regulations.

Line 1 lists the model, serial number, FAA registration number and the owner of the helicopter.

Line 2 lists the pilots name, date of the flight, reason for the flight, total flight hours, number of start-up cycles and the totals for the day.

Line 3 lists the total aircraft engine hours, the total start-up cycles brought forward, totals for today, and accumulative totals. These are the numbers that must be brought forward to the next days form: the hours, when the next inspection is due, the type of inspection and the date the next annual inspection is due.

Line 4 lists the name of the person filling out the form (usually the pilot), that persons FAA pilot certificate number and the date the form is filled out. This is a legal document and the person filling it out certifies that the daily inspection was in fact done.

Line 5 has a place for discrepancies and the corrective action. On the second copy the pilot lists the passengers names and/or radio call numbers.

Line 6 lists the number of helicopter landings.

The original is filed in sequence and must remain as part of the aircraft records. If the aircraft is sold, the records go with the aircraft. The second copy is filed in the Physical Services Department with forms A & B.

A sample of all forms are attached.

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
HELICOPTER FLIGHT REQUEST

A PAGE # 1

TO: John W. O'Brien
Chief of Physical Services

DEPARTMENT: ENGINEERING DEPARTURE DATE: 6-1-94
DEPARTURE TIME: 11:00 A RETURN TIME: 12:15 P
DESTINATION: PLAZA 6 & PLAZA 41
REASON FOR FLIGHT: TO INSPECT THE PLAZA LANES
TO DETERMINE IF THEY NEED TO BE
RE-DESIGNED

PASSENGERS: 921 CHET HERNE 906 MAL SERIKOWSKY

SAMPLE

SIGNATURE: Ken DeSutter
(DEPARTMENT HEAD)

SIGNATURE: J. O'Brien
CHIEF OF PHYSICAL SERVICES

APPROVED DISAPPROVED

REMARKS: MUST BE BACK TO CA BY 12:15 P
FOR ANOTHER FLIGHT.

REVISED 09/93

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY
HELICOPTER FLIGHT REQUEST

B PAGE #2

TO: John W. O'Brien
Chief of Physical Services

DEPARTMENT: GOVERNORS OFFICE DEPARTURE DATE: 6-1-94
DEPARTURE TIME: 12:15 PM RETURN TIME: 8:00 PM
DESTINATION: PICK UP MIDWAY 12:15PM TO LOMBARD - FLY
REASON FOR FLIGHT: TO MKLS 7:00 P

PASSENGERS: GOV EDGAR MATT GOLDBERG SECURITY
ADD GARY MACK ON FLIGHT TO MKLS

SAMPLE

SIGNATURE: J O'Brien
(DEPARTMENT HEAD)

SIGNATURE: J O'Brien
CHIEF OF PHYSICAL SERVICES

APPROVED DISAPPROVED

REMARKS: BILL TO CITIZENS FOR EDGAR

REVISED 09/93

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

1111

DAILY AVIATION MISSION REPORT

THH

| DATE | | AIRCRAFT | | MODEL | | PRE FLIGHT TACH | | |
|--|------------|---------------|-------|------------------------|-----------|-----------------|--------------|-------------|
| 6-1-94 | | N-193 TW L-75 | | 206 L-4 | | 205.4 | | |
| PILOT | PASSENGERS | LOCATION | TIME | | MISSION | DEPT. | TACH READING | BLOCK HOURS |
| | | | FROM | TO | | | | |
| RA | 921 906 | PL-6 PL-41 CA | 1105 | 1210 | PLAZA MSP | ENH | 206.5 | 1.1 |
| RA | - | MDW | 1215 | 1225 | GOV TRANS | GOV | 206.7 | .2 |
| RA | GOV + 2 | LOMBARD | 1245 | 1310 | GOV TRANS | GOV | 207.0 | .3 |
| RA | GOV + 3 | CGX | 1850 | 1910 | GOV TRANS | GOV | 207.3 | .3 |
| RA | - | CA | 1915 | 1930 | GOV TRANS | GOV | 207.5 | .2 |
| <div style="border: 2px solid black; border-radius: 50%; width: 50px; height: 50px; display: flex; align-items: center; justify-content: center; margin: 0 auto;"> B </div> <p style="text-align: center; font-size: 24px; font-weight: bold; margin: 5px 0;">PAGE 1</p> <p style="text-align: center; font-size: 24px; font-weight: bold; margin: 5px 0;">V</p> <p style="text-align: center; font-size: 18px; font-weight: bold; margin: 5px 0;">SMITH 2 WITH LANNING S</p> | | | | | | | | |
| FUEL | | SQUAWKS | | ACTION | | SIGNATURE | | TOTAL |
| ADDED | TOTAL TANK | COST | ADDED | TOTAL TANK | COST | SIGNATURE | | |
| | 300 | | | 300 | 1.5 | RA RK | | 2.1 |
| 300 | 600 | CA | 5A | RA RK | | | | |
| ANTI COLL LIGHT OUT | | | | | | SIGNATURE | | |
| | | | | REPLACE BULB CHECK OUT | | SIGNATURE | | |
| | | | | | | SIGNATURE | | |
| | | | | | | SIGNATURE | | |

AIRCRAFT MODEL: 206L-4 SERIAL NO. 52026 REGISTRATION NO. N193TW OWNER ISTHA

| PILOT'S NAME | DATE | TYPE FLIGHT | AIRCRAFT HOURS | STARTS ENG 1 CYCLES | STARTS ENG 2 CYCLES | POWER ASSURANCE | ENG 1 | ENG 2 |
|-----------------|------|-------------|----------------|---------------------|---------------------|-----------------|-------|-------|
| R. QUEKENS | 6/1 | PLAZA INSP | 1.1 | 1 | | TORQUE | | |
| R. QUEKENS | 6/1 | 500V TRANS | 1.0 | 3 | | TOT/ITT | | |
| | | | | | | N ₁ | | |
| | | | | | | N ₂ | | |
| | | | | | | OAT | | |
| TOTAL FOR TODAY | | | 2.1 | 4 | | PA. | | |

SAMPLE

| AIRCRAFT ENGINE FLIGHT HOURS & CYCLES | AIRCRAFT HOURS | ENGINE 1 HOURS | ENGINE 2 HOURS | ENGINE 1 CYCLES | ENGINE 2 CYCLES |
|---------------------------------------|----------------|----------------|----------------|-----------------|-----------------|
| TOTALS BROUGHT FORWARD | 205.4 | 205.4 | . | 465 | |
| TOTALS FOR TODAY | 2.1 | 2.1 | . | 4 | |
| ACCUMULATIVE TOTALS | 207.5 | 207.5 | . | 469 | |
| NEXT SCHEDULED INSPECTION DUE | 300.0 | | | | |
| TYPE INSPECTION (50, 100, ETC.) | 100 | | | | |
| ANNUAL INSP. DUE DATE | 5-31-95 | | | | |

I CERTIFY THAT THE DAILY INSPECTION WAS COMPLETED ACCORDING TO THE MAINTENANCE MANUAL

R. QUEKENS (4)
NAME & CERTIFICATE NO.

ATP 1613316 (4)
DATE 6-1-95 (4)

PILOTS AND MAINTENANCE RECORD

PILOTS ENTER DISCREPANCIES - MECHANICS ENTER ALL MAINTENANCE PERFORMED

| FLIGHT DISCREPANCIES | REMARKS |
|----------------------|---------------------------------|
| 1 | |
| CORRECTIVE ACTION | |
| 2 | |
| CORRECTIVE ACTION | |
| 3 | |
| CORRECTIVE ACTION | |
| 4 | ANTI COLL LIGHT OUT ECR |
| CORRECTIVE ACTION | REPLACED BULB CHECKED OUT OK RK |
| 5 | |
| CORRECTIVE ACTION | |

HELICOPTER LOG

5

| | | | |
|--------------------------|---------------------|----------------------------|----------------|
| AIRCRAFT MODEL 206L-4 | SERIAL NO. 52026 | REGISTRATION NO. N193TW | OWNER ISTHA |
|--------------------------|---------------------|----------------------------|----------------|

| PILOT'S NAME | DATE | TYPE FLIGHT | AIRCRAFT HOURS | STARTS ENG 1 CYCLES | STARTS ENG 2 CYCLES | POWER ASSURANCE | ENG 1 | ENG 2 |
|-----------------|------|-------------|----------------|---------------------|---------------------|-----------------|-------|-------|
| R. BUKHANS | 6/1 | PLAZA INSP | 1.1 | 1 | | TORQUE | | |
| R. BUKHANS | 6/1 | GOV TRANS | 1.0 | 3 | | TOT/ITT | | |
| | | | . | | | N ₁ | | |
| | | | . | | | N ₂ | | |
| | | | . | | | OAT | | |
| TOTAL FOR TODAY | | | 2.1 | 4 | | PA. | | |

SAMPLE

| AIRCRAFT & ENGINE FLIGHT HOURS & CYCLES | AIRCRAFT HOURS | ENGINE 1 HOURS | ENGINE 2 HOURS | ENGINE 1 CYCLES | ENGINE 2 CYCLES | I CERTIFY THAT THE DAILY INSPECTION WAS COMPLETED ACCORDING TO THE MAINTENANCE MANUAL R. BUKHANS NAME & CERTIFICATE NO. ATP 1613316 DATE 6-1-95 |
|---|----------------|----------------|----------------|-----------------|-----------------|--|
| TOTALS BROUGHT FORWARD | 205.4 | 205.4 | . | 465 | | |
| TOTALS FOR TODAY | 2.1 | 2.1 | . | 4 | | |
| ACCUMULATIVE TOTALS | 207.5 | 207.5 | . | 469 | | |
| NEXT SCHEDULED INSPECTION DUE | 300.0 | . | . | | | |
| TYPE INSPECTION (50, 100, ETC.) | 100 | | | | | |
| ANNUAL INSP. DUE DATE | 5-31-95 | | | | | |

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PAGE 2

PILOTS AND MAINTENANCE RECORD

PILOTS ENTER DISCREPANCIES - MECHANICS ENTER ALL MAINTENANCE PERFORMED

| FLIGHT DISCREPANCIES | REMARKS |
|----------------------|--|
| 1 | 921 906 |
| CORRECTIVE ACTION | |
| 2 | GOV ROGAR MATT GOLDBERG SECURITY |
| CORRECTIVE ACTION | |
| 3 | GOV ROGAR MATT GOLDBERG GARY MACK SECURITY |
| CORRECTIVE ACTION | |
| 4 | ANTI COLL LIGHT OUT ECU |
| CORRECTIVE ACTION | REPLACED BULB CHECKED OUT OK RK |
| 5 | |
| CORRECTIVE ACTION | |

HELICOPTER LOG 5

12/16/93

6/a

RESOLUTION NO. 13951

WHEREAS, the Authority desires to obtain the services of a helicopter pilot and operator for the Authority's Bell 206L-4 Long Ranger Helicopter; and

WHEREAS, Edward C. Quedens represents himself to be well qualified, licensed and experienced to perform the services desired by the Authority; and

WHEREAS, said services are for professional, technical or artistic skills and services, and bidding is not required.

NOW, THEREFORE, BE IT RESOLVED by The Illinois State Toll Highway Authority as follows:

That the Legal Department of the Authority is hereby authorized and directed to prepare an agreement with Edward C. Quedens to perform services as helicopter pilot and operator of the Authority's Bell 206L-4 Long Ranger Helicopter or any substitution thereof. In addition to the operation of said helicopter, Edward C. Quedens shall perform other general administrative duties as directed by the Executive Director and/or Chief of Physical Services of the Authority. Said agreement to include provision for working hours, two weeks vacation and compensatory time. Compensation for said services will be \$45,177.00 per annum for the period January 1, 1994 through December 31, 1994, with an upper limit of compensation not to exceed \$60,000.00, and the Chairman of the Authority is authorized to execute said agreement for and on behalf of the Authority.

AUDITOR'S COMMENTS
REGARDING AUTHORITY RESPONSE

In the first paragraph of the Illinois State Toll Highway Authority's response (on page 27), the Authority reports that all Helicopter Log Reports are now accounted for. We are pleased to note that the Authority has apparently now accounted for the missing flight logs we identified, although Authority officials could not produce these flight logs during our field work (see report page 4).

The Authority has furnished helicopter cost estimates per flight hour based on 240 flight hours (see its Exhibit 2 on page 32). These estimates differ in some respects from our own cost estimates in Exhibit 6 on page 11. A side-by-side comparison of the cost estimates is as follows:

| | <u>AUTHORITY</u> <u>MECHANIC AT</u> <u>18%</u> | <u>AUDITOR GENERAL</u> <u>MECHANIC AT</u> <u>18% 100%</u> | |
|--|--|--|---------------------|
| <u>DIRECT COSTS:</u> | | | |
| Mechanic | \$ 37 | \$ 36 | \$200 |
| Fuel | 25 | 25 | 25 |
| Lubricants | 1 | 1 | 1 |
| Airframe Parts | 68 | 100 | 100 |
| Powerplant Parts & Maint. | <u>60</u> | <u>65</u> | <u>65</u> |
| TOTAL DIRECT COSTS | <u>\$191</u> | <u>\$227</u> | <u>\$391</u> |
| <u>INDIRECT COSTS:</u> | | | |
| Pilot | \$188 | \$193 | \$193 |
| Insurance | <u>135</u> | <u>127</u> | <u>127</u> |
| TOTAL INDIRECT COSTS | <u>\$323</u> | <u>\$320</u> | <u>\$320</u> |
| TOTAL EST. COST PER HOUR FOR 240 FLIGHT HOURS | <u>\$514</u> | <u>\$547</u> | <u>\$711</u> |

Although these estimates contain data for different fiscal years (1994 for the Authority and 1993 for the Auditor General), they are comparable in many respects. The two main differences, other than the variations caused by comparing data for two different fiscal years, are found in the allowance for the cost of parts and in the percentage of the mechanic's salary allocated to the cost estimate.

Our estimate of the cost of parts was taken directly from the Bell Helicopter Bulletin furnished to us by the Authority. The Authority has used that same source, but has reduced its cost estimate for parts based on its theory that the Bell Helicopter Bulletin costs are averages

which include considerable flight time over the Gulf of Mexico. The Authority contends that the corrosive effect of salt water would cause the need for more frequent parts replacement than would be needed in Illinois.

The Authority's estimate of its mechanic's time spent on the helicopter is 18%. We have also shown an 18% allocation for purposes of comparison. However, since there was no separate accounting of the mechanic's time available to support the 18% estimate, we have also shown the cost allocation that would exist if the mechanic's full salary were chargeable to helicopter costs. We note that the Authority now plans to implement our recommendation to establish a cost allocation system which will formally allocate costs to the helicopter operation.