

## **Project 10-019 Slips, Trips and Falls SURFOR, SUBFOR, AIRFOR, NECC**

### **Data**

Data Range: FY00 to present (6/3/2010)

Data Source: NAVSEA is the data source for shipyard OSHE data. INJTRK and SIMS databases from the Navy Safety Center.

### **Bottom line Up Front**

- SURFOR: There is a statistically significant increase shift in slip, trip and fall incident rates in FY03, FY06 and FY09. On duty slip, trip and fall incidents are the contributing factor to the increase shift in FY03. Both on and off duty slip, trip and fall incidents are contributing factors to the increase shift in FY06 and FY09.
- SUBFOR: Statistical significant increase shift beginning in FY06 and leveling out once more beginning in FY08.
- For AIRFOR, there is a statistical significant increase shift beginning in FY03 and a statistical significant spike in FY06. On duty mishaps are the contributing factor to the spike in FY06.
- Starting in the FY06, NECC slip, trip and fall incident rates are decreasing as compared to FY02 to FY05 rates.
- Personnel under the age of 25 have a higher probability of being involved in an on duty slip, trip and fall mishap for SURFOR, SUBFOR, and AIRFOR
- NECC personnel between the ages of 36 to 45 have a higher probability of being involved in an on duty slip, trip and fall mishap.
- Personnel under the age of 25 have a higher probability of being involved in an off duty slip, trip and fall mishap for SURFOR, SUBFOR, AIRFOR and NECC.
- For all TYCOMs, Personnel/Human Factors: Lack of Attention to Detail is the top causal factor identified.
- Starting in FY09 there is an upward trend in slip, trip and fall incident rates involving ladders for SURFOR.
- The current FY10 slip, trip and fall incident rate involving ladders for AIRFOR and SUBFOR are statistically significant lower than the previous five years rates.

### **Discussion**

#### **SURFOR**

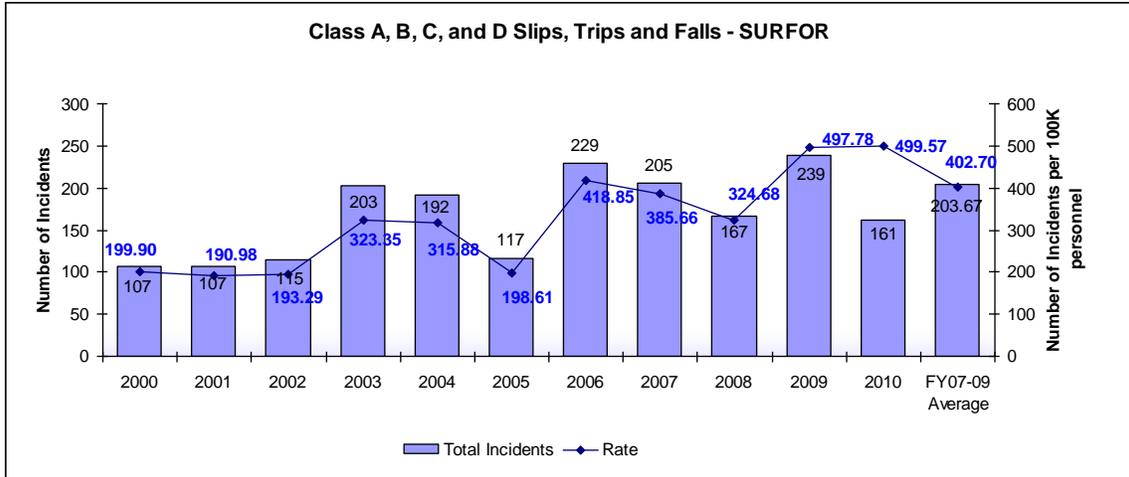


Figure 1

Figure 1 graphs the number of slips, trips and falls Class A, B, C and D mishaps for SURFOR along with the incident rates per 100,000 personnel. There does not seem to be a consistent pattern to the rates over the eleven year period. However, there does seem to be a number of years where the number of mishaps is over two hundred starting after FY05. This may be due to the introduction of WESS. When statistically comparing the rates from FY00-04 to the rates from FY05-09, there is no statistically significant difference between the incident rates from FY00 to FY04 and incident rates from FY05 to FY09.

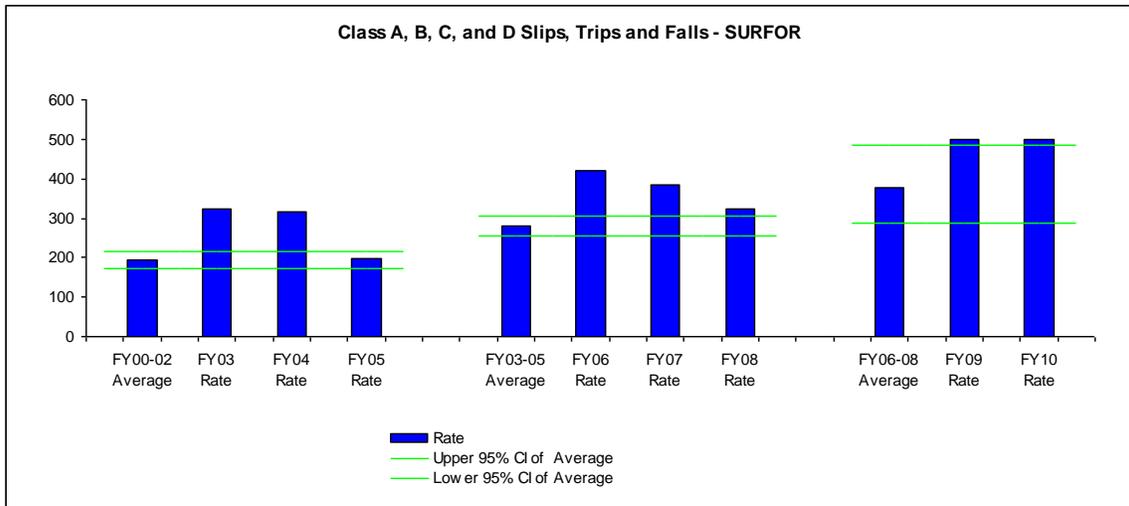
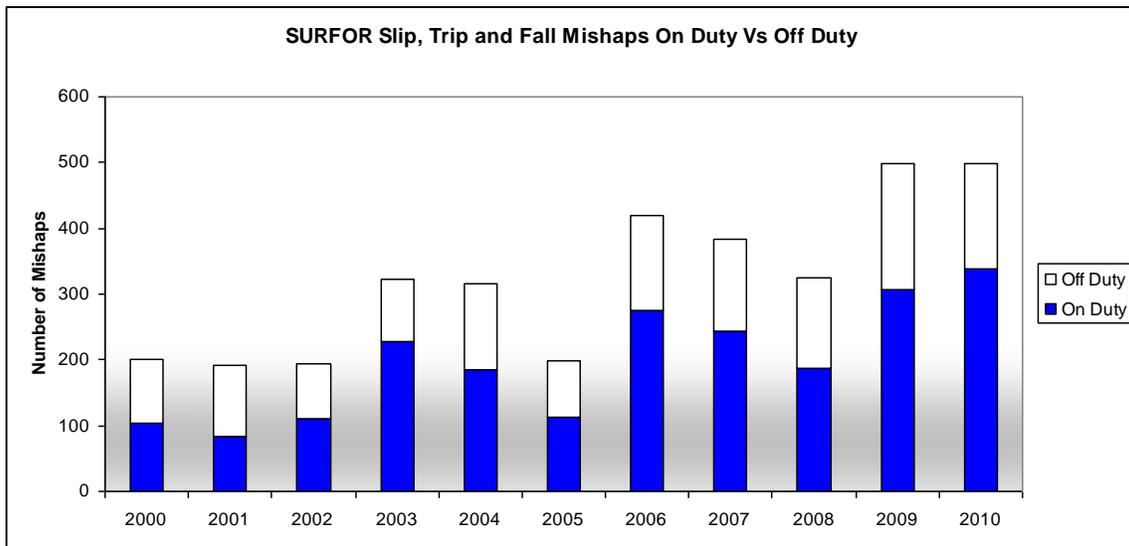


Figure 2

The first portion of Figure 2 graphs the three year average SURFOR slip, trip and fall incident rate, the FY03, FY04 and FY05 SURFOR slip, trip and fall incident rates along with the 95% confidence interval calculated from the FY00 to FY02 data. Both the FY03 and FY04 rates are above the confidence interval indicating a statistically significant increase in the rates from the previous rates in FY00 to FY02. It can be concluded there is a statistically significant increase in rates being in FY03.

Due the statistically significant increase shift in FY03, the second portion of Figure 2 graphs the three year average rate from FY03 to FY05, the FY06, FY07 and FY08 SURFOR slip, trip and fall incident rates along with the 95% confidence interval which has been recalculated using the data from FY03 to FY05. The rates from FY06, FY07 and FY08 are above the confidence interval again indicating a statistically significant increase in the rates from the previous FY03 to FY05 rates. It can be concluded that there is another statistically significant increase shift beginning in FY06.

Again due to the statistically significant increase shift in FY06, the third portion of Figure 2 graphs the three year average rate from FY06 to FY08, the FY09 and the current FY10 SURFOR slip, trip and fall incident rates along with the 95% confidence interval which again has been recalculated using the data from FY06 to FY08. The rates from FY09 and the current FY10 rates are statistically significantly higher than the rates from the previous three years. It can be concluded again that there is a statistically significant shift in the data beginning in FY09. Although, this statistically significant increase shift may also be due to the decrease in SURFOR population as well as the increase in slip, trip and fall mishaps.



**Figure 3**

Figure 3 graphs the number of on and off duty SURFOR slip, trip and fall mishap per fiscal year over a period ranging from FY00 to the present. The number of on duty mishaps is greater than the number of off duty mishaps for every fiscal year graphed.

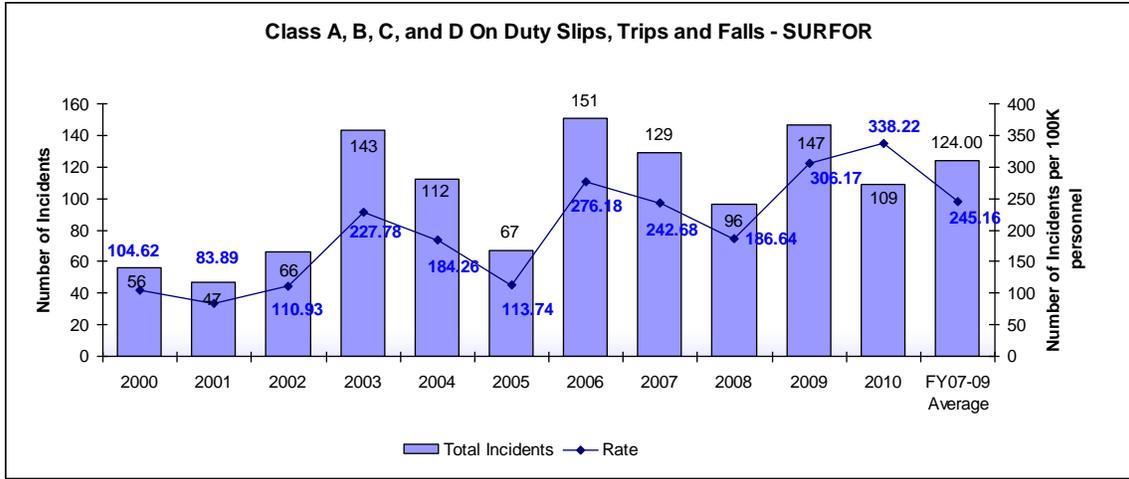


Figure 4

To further analyze the data, the SURFOR data is divided into on-duty and off-duty. Figure 3 above graphs the number and rate per 100,000 personnel of on-duty slip, trip and fall incidents. Figure 4 tends to mirror Figure 1. There is an increase in the number and rate in FY03, FY06 and FY09, however, when statistically comparing the rates from FY00 to FY04 to the rates from FY05 to FY09, there is no statistically significant differences amongst the rates.

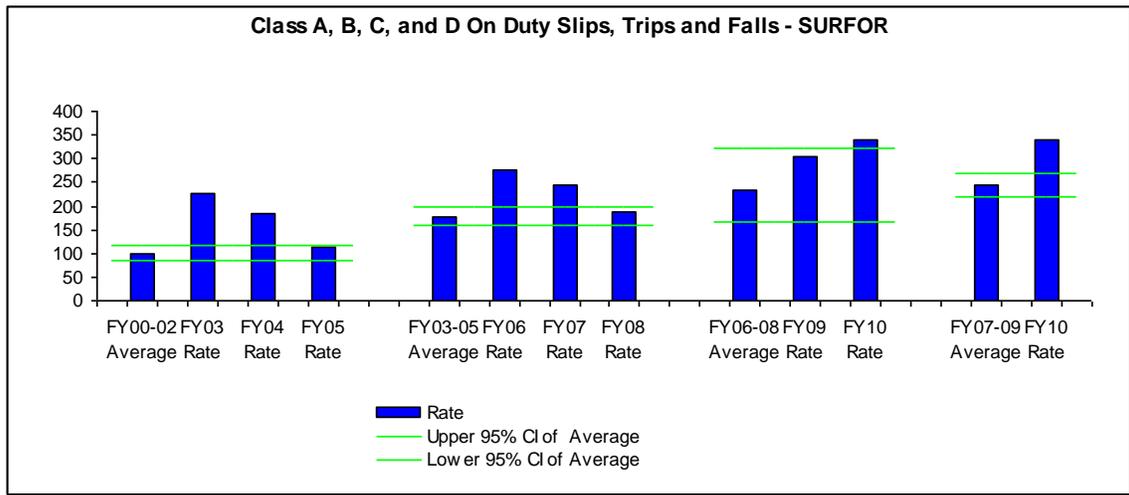


Figure 5

Figure 5 is the same graph as Figure 2 except that it graphs SURFOR on duty slip, trip and fall mishap data. It is evident from Figure 5 that there is a statistically significant increase shift of SURFOR on duty slip, trip and fall incident rates beginning in FY03 and another statistically significant increase shift beginning in FY06. This is the same increase shift that is evident for the overall SURFOR slip, trip and fall mishap graphed in Figure 2. The third portion of Figure 5 differs from Figure 2 in that the FY09 on duty slip, trip and fall incident rate is not statistically significant higher than the three years previous rates as is the case in Figure 2. The fourth portion of Figure 5 graphs the three years average incident rate for SURFOR on duty slip, trip and fall mishap and the current FY10 SURFOR on duty slip, trip and fall incident rate along with the 95% confidence

interval which is recalculated using FY07 to FY09 data. The current FY10 rate is above the confidence interval indicating the current FY10 is statistically significantly higher than the rates from FY07 to FY09. There seems to be another statistically significant increase shift beginning in FY10.

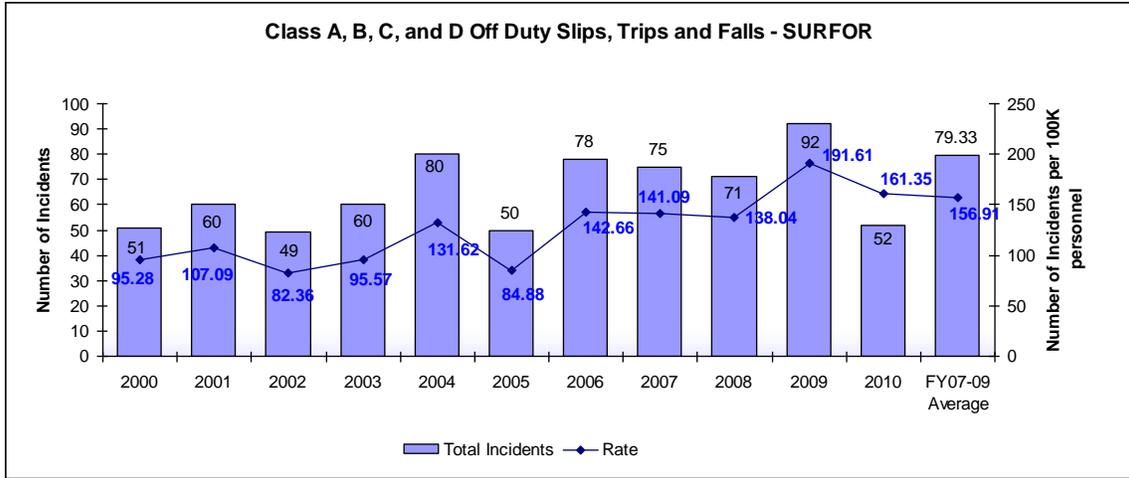


Figure 6

Figure 6 graphs the number and rates per 100,000 personnel of off-duty slip, trip and fall incidents over a time period ranging from FY00 to the present. There seems to be an increase in the numbers of mishaps starting in FY06. This may be due to introduction of WESS. When statistically comparing the rates from FY00-04 to the rates from FY05-09, the rates from FY05-09 are statistically significantly higher than the rates from FY00-04. It can be concluded that there is an increasing trend for off-duty slip, trip and fall incident rates.

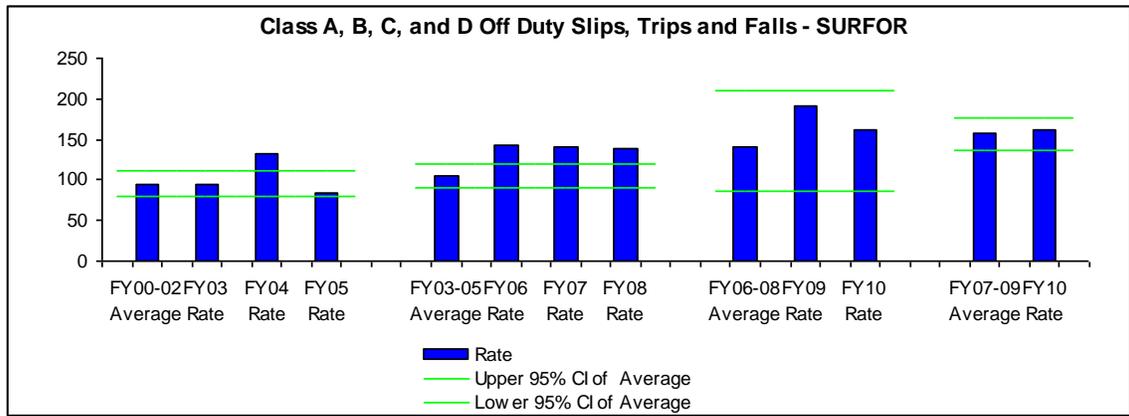


Figure 7

Figure 7 graphs SURFOR off duty incident rate averages, rates, and confidence intervals in the same manner as in Figure 2 and Figure 5. For off duty mishaps, there is not a statistically significant increase shift in rates in FY03 as there is with the overall and on duty rates in Figure 2 and Figure 5 respectively. There is a statistically significant increase shift beginning in FY06 as is evident in the second portion of Figure 7 where the FY06, FY07 and FY08 rates are above the confidence interval indicating statistically

significant increases in the off duty rates as compare to the rates from FY03 to FY05. This increase shift is also seen in the overall data and the on duty data in Figure 2 and Figure 5 respectively. When the confidence interval is recalculated after the increase shift in FY06, there are no other statistically significant increases in off duty rates or any other statistically significant shifts.

From the analysis on SURFOR slip, trip and fall incident rates, it can be concluded that on duty mishaps are the contributing factor to the statistically significant increase shift in FY03 and FY10. A combination of both on and off duty mishaps are the contributing factors to the increase shift in FY09 for overall SURFOR slip, trip and fall incident rates in Figure 2.

**SUBFOR**

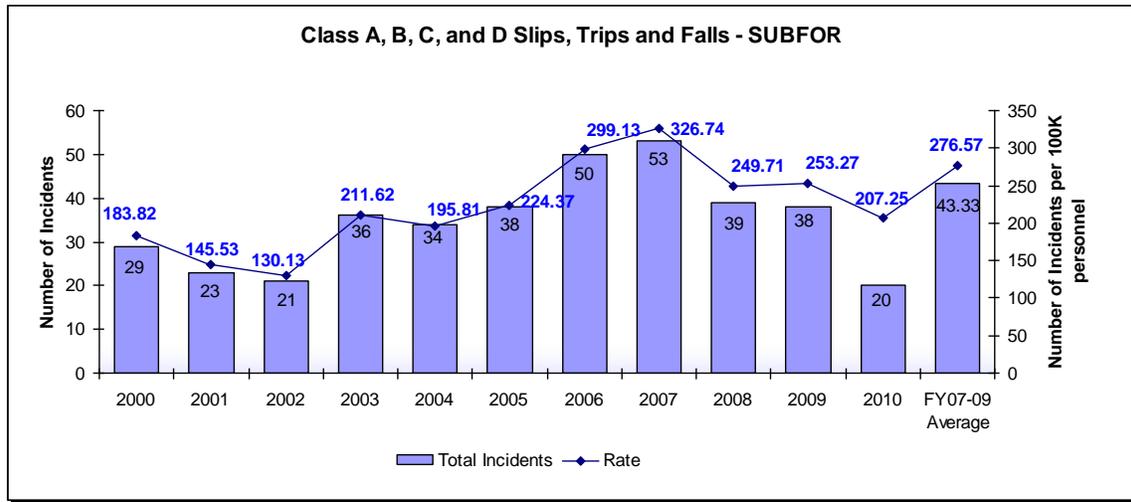
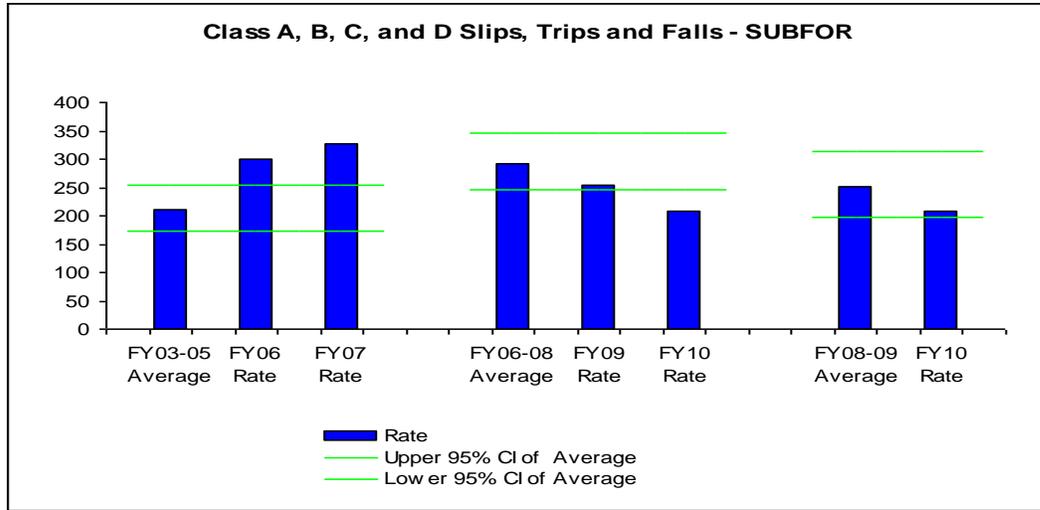


Figure 8

Similar to Figure 1, Figure 8 graphs the number of slip, trip and fall incidents and the incident rates per 100,000 personnel for SUBFOR. There is a spike in the number and rates in FY06 and FY07 and the number tend to level off once more after FY07.



**Figure 9**

To determine if the increases in FY06 and FY07 are statistically significant, the 95% confidence interval for the time period ranging from FY03 to FY05 are calculated and the rates for FY06 and FY07 are compared. This can be seen in the first part in Figure 9 where the FY03-05 average and the rates for FY06 and FY07 are graphed along with the confidence interval depicted by the green lines. Both rates for FY06 and FY07 are above the upper confidence interval boundary indicating a statistically significant increase in the rates for both fiscal years. It can then be concluded that a statistically significant shift in the rates has occurred starting in FY06.

The 3 year 95% confidence interval ranging from FY06 to FY08 is recalculated due to the significant shift. The new confidence intervals are depicted by the green line in the center of Figure 9 along with the FY06-08 average rate and the FY09 and current FY10 rates. The FY09 rate is within the confidence interval and the current FY10 rate is below the confidence interval. This indicates that the FY09 is not statistically significant different from the FY06-08 rates. The current FY10 rate is statistically significantly lower than the FY06-08 rates.

The last section of Figure 9 recalculates the 95% confidence interval using the mishap data from FY08 and FY09 and depicts the new confidence interval by the green lines. In addition, the FY08-09 average rate and the current FY10 rate is also graphed. With the recalculated confidence interval, the current FY10 rate is within the confidence interval indicating no statistical significant difference amongst the current FY10 rate and the FY08-09 rates. When FY04-05 rates are statistically compared to the FY08-09 rates, there is no statistically significant difference in the rates. It can be concluded that the rates beginning with FY08 are leveling back to the rates before the spike in FY06 and FY07.

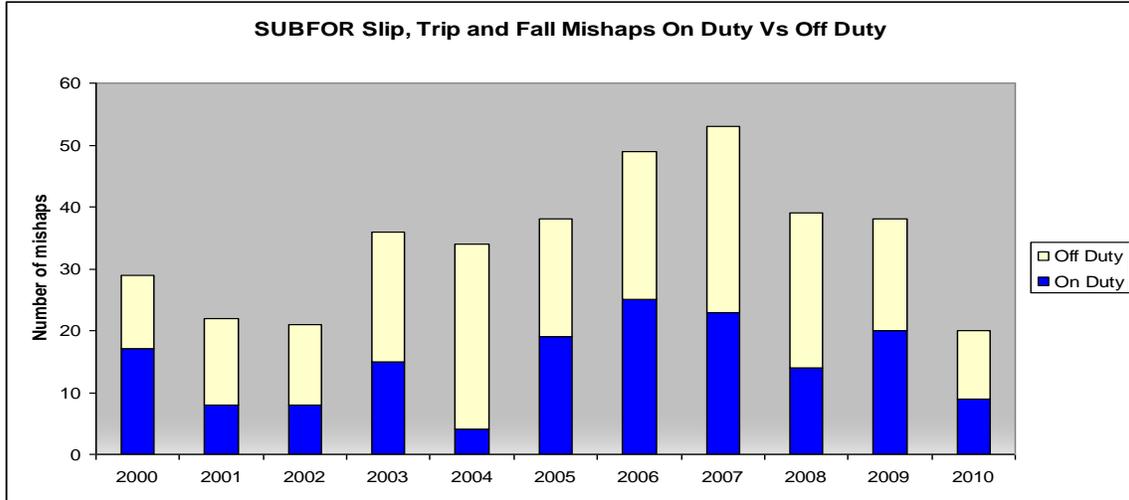


Figure 10

To further delve into the SUBFOR slip, trip and fall mishap data, the data is divided into on and off duty. Figure 10 is a stack chart that graphs the number of on and off duty SUBFOR mishaps per fiscal year. There tends to be a larger number of off duty slip, trip and fall mishaps in most of the fiscal years except for FY00, FY06 and FY09 where there seem to more on duty mishaps.

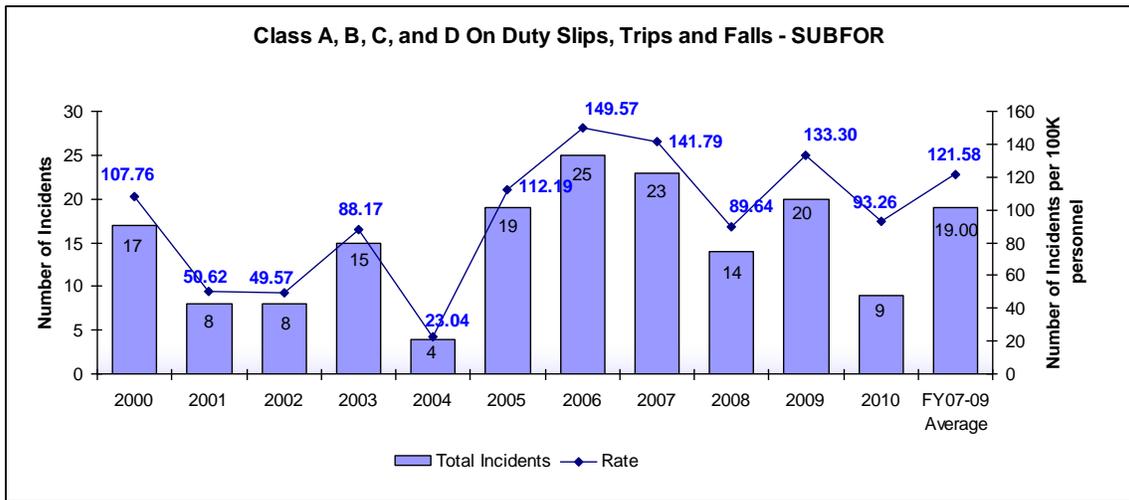


Figure 11

Figure 11 is the same graph as Figure 8 except it only graphs on duty slip, trip and fall mishaps. The on duty slip, trip and fall rates tend to mirror the rates in Figure 8. There again seems to be a spike in FY06 and FY07 and then begins to level out again.

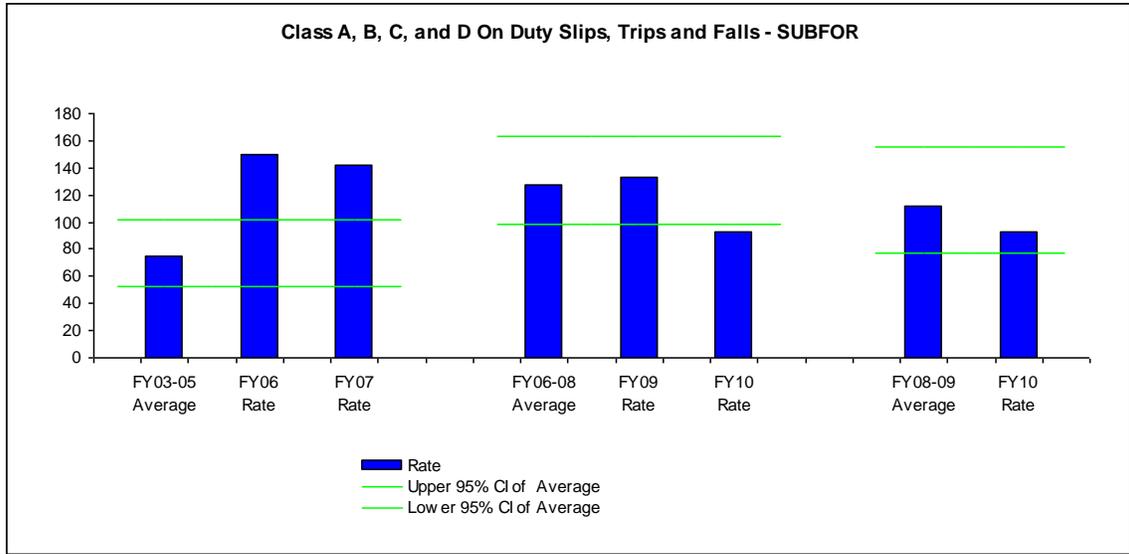


Figure 12

Figure 12 is similar to Figure 9 except it graphs the on duty slip, trip and fall rates. Much the same as the overall slip, trip and fall rates. There is a statistical significant increase in the rates beginning in FY06 and leveling off again in starting in FY08. This is identical to the overall slip, trip and fall rates graphed in Figure 9.

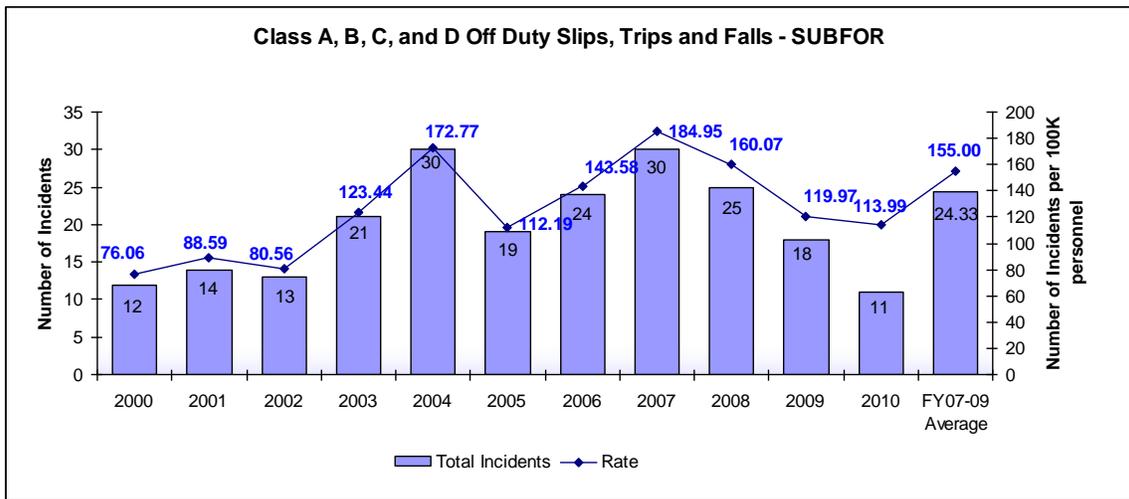
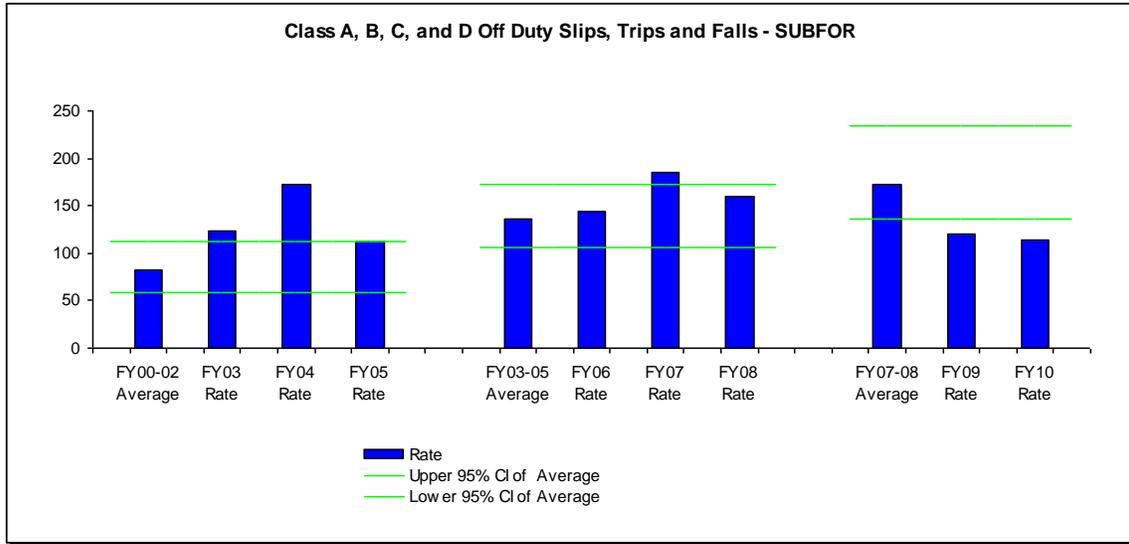


Figure 13

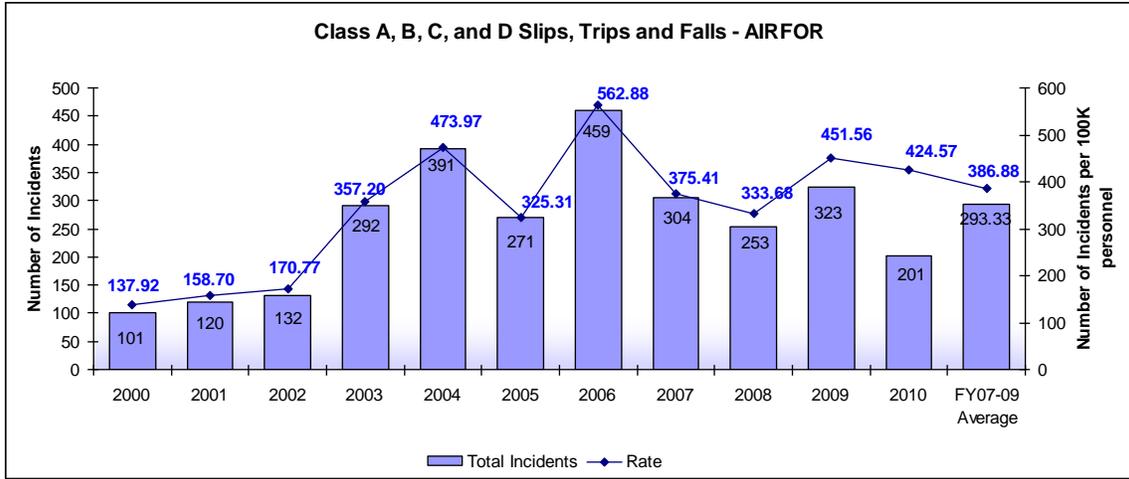
Figure 13 graphs the off duty slip, trip and fall data for SUBFOR. There seems to be two increase shifts, one beginning in FY03 and the next being in FY07. There also seems to be a downward shift beginning in FY09.



**Figure 14**

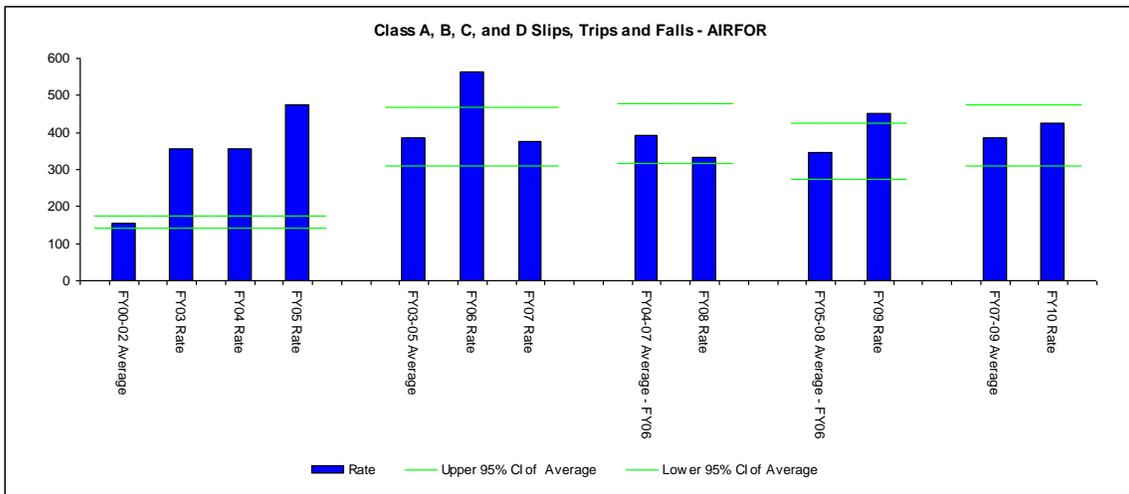
To determine if there is a statistically significant shift beginning in FY03, the 95% confidence interval for FY00-02 is calculated and is graphed in the first portion of Figure 14 depicted by the green lines. In addition to the confidence interval, the first portion of Figure 14 graphs the FY03, FY04 and FY05 rates. All three of the rates are above the confidence interval indicating a statistically significant increase shift beginning in FY03. Due to the statistically significant shift, the confidence interval is recalculated. The new confidence interval is depicted by the green line in the second portion of Figure 14. Along with the recalculated confidence interval, the second portion of Figure 14 graphs the FY06, FY07 and FY08 rates. FY06 and FY08 rates are within the confidence interval but FY07 is above the confidence interval indicating a statistically significant increase. A second statistically significant increase shift occurs in FY07. The confidence interval is again recalculated from the point of the shift in FY07. The third portion of the Figure 13 graphs the new confidence interval depicted by the green lines and the FY09 and current FY10 rates. Both of the rates are below the confidence interval indicating both rates have statistically significantly decreased. It can be concluded that there is another statistical significant shift beginning in FY09 although this shift is decreasing.

## **AIRFOR**



**Figure 15**

Figure 15 graphs the number and rates per 100,000 personnel of slip, trip and fall incident for AIRFOR for a period ranging from FY00 to the present. There seems to be an statistical significant increase shift beginning in FY03 and a spike in FY06.



**Figure 16**

The first portion of Figure 16 graphs the three year average ranging from FY00-02 and the rates from FY03, FY04 and FY05 along with the 95% confidence interval calculated using the FY00 to FY02 data. All three rates from FY03 to FY05 are above the confidence interval indicating all three rates have statistically significantly increased from the FY00 to FY02. It can be concluded from the first portion of Figure 16 that there is a statistically significant increase shift beginning in FY03.

Since there is a statistical significant shift, the 95% confidence interval is recalculated starting in FY03 to FY05. The second portion of Figure 16 graphs the new confidence interval represented by the green lines along with the rates from FY06 and FY07. The FY06 rate is above the confidence interval indicating a statistically significant increase. The FY07 rate falls within the confidence interval indicating no statistically significant difference amongst the FY07 and the rates from FY03 to FY05. It can be concluded that

the increase in the FY06 rate is due to a spike in the number of mishaps for that fiscal year. For this reason, the FY06 rates will be eliminated from the continuing analysis.

The next three portions in Figure 16 graph a three year rolling average along with 95% confidence interval based on the rolling three year data and the next year rate. The FY08 rate falls within the confidence interval indicating no statistically significant difference in the FY08 rate and the previous rates from FY04, FY05 and FY07. The FY09 rate is above the confidence interval indicating a statistically significant increase in the rate compared to FY05, FY07 and FY08. The statistically significant increase is due to a decrease in the population size from previous years. The current FY10 rate is within the confidence interval indicating no statistical difference amongst the FY10 rate and the previous three years rates.

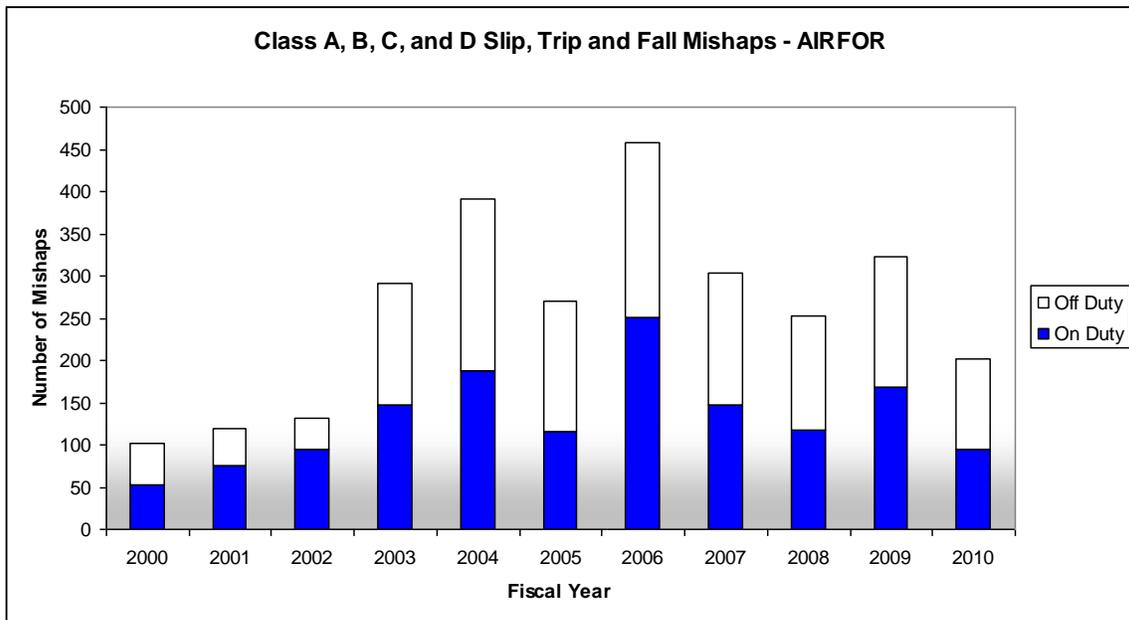


Figure 17

To further explore the data, it has been divided into on and off duty. Figure 17 is a stack chart that graphs the number of on and off duty mishaps per fiscal year. Starting in FY03 the numbers of on and off duty mishaps tend to be relatively evenly distributed between both on and off duty.

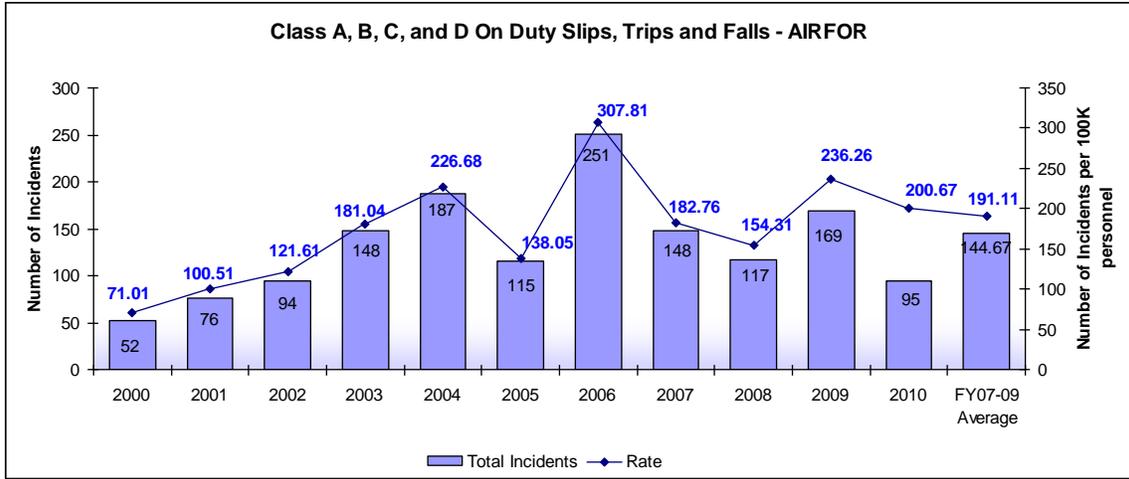


Figure 18

Much like Figure 15 above, Figure 18 graphs the number and rates per 100,000 personnel for on duty slip, trip and fall incidents for AIRFOR from FY00 to the present. The rates tend to follow a similar pattern to the overall rates in Figure 15. There seems to be an increase shift starting in FY03 and a spike in FY06.

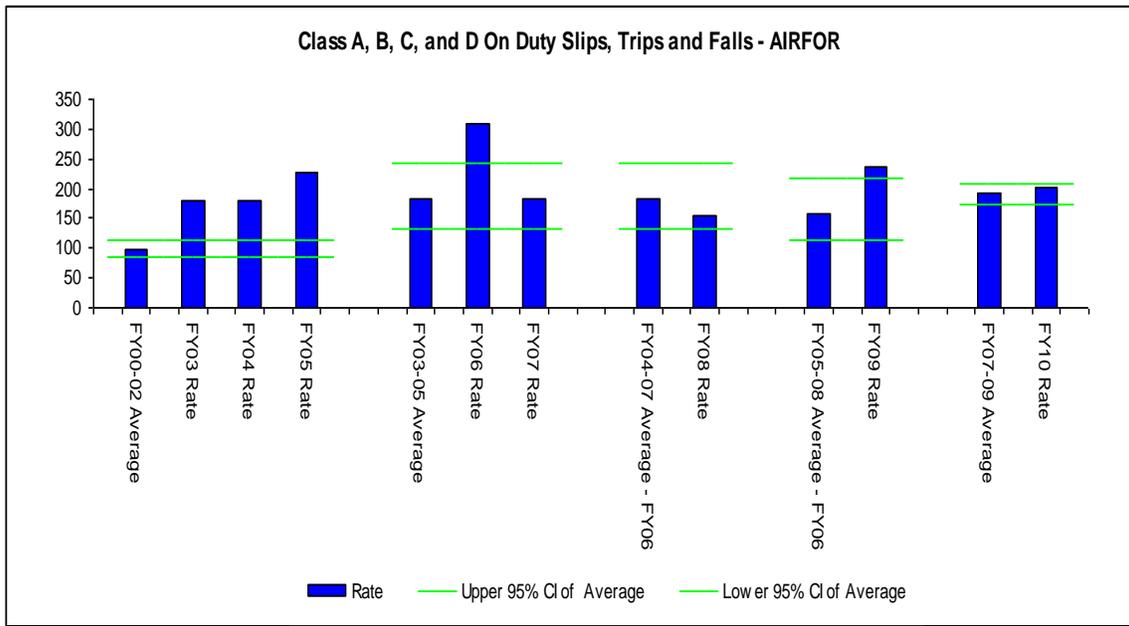
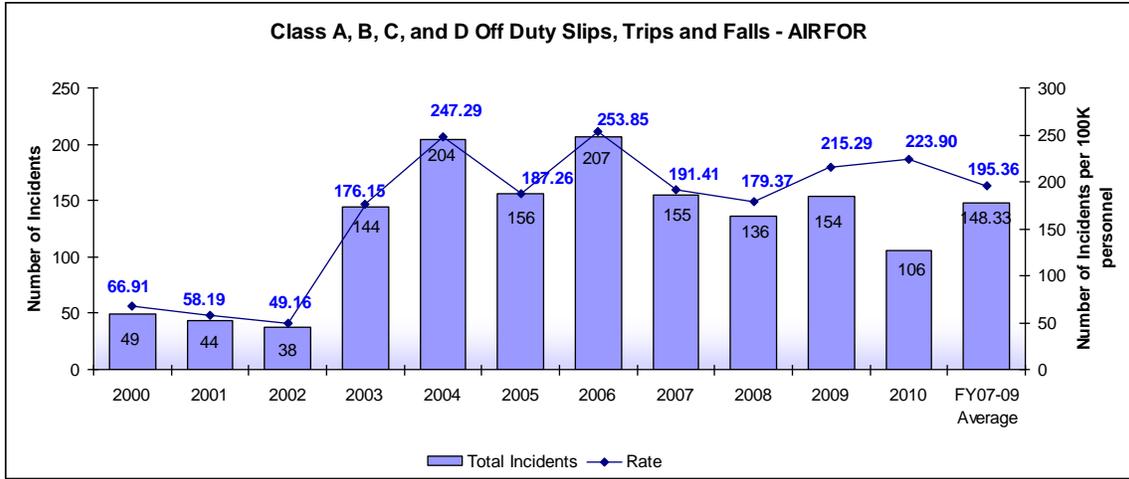


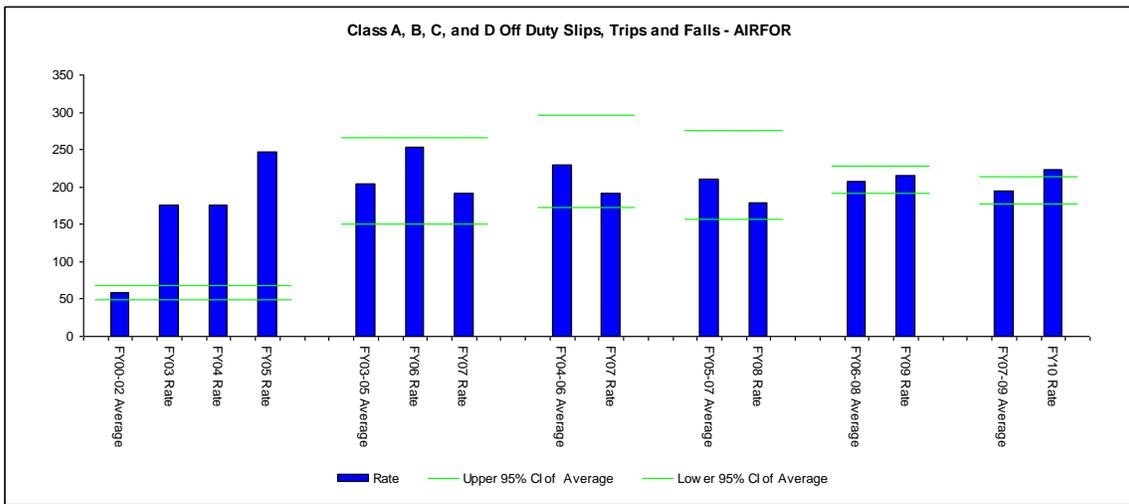
Figure 19

The same analysis is conducted for the on duty slip, trip and fall incidents as was conducted for overall AIRFOR slip, trip and fall incident in Figure 16. The on duty mishaps conclusions are the same as with the overall incidents. There is a statistically significant increase shift beginning in FY03 and a spike in FY06. As with the overall FY09 rate, the FY09 on duty rate is statistically significant higher than the previous years due to the decrease in population.



**Figure 20**

Figure 20 is similar to Figure 18 above except it graphs the off duty slip, trip and fall mishaps for AIRFOR. The off duty tends to follow a similar pattern as to the overall and on duty mishaps in Figures 15 and 18 respectively. There seems to be an increase shift starting in FY03 and a spike in FY06.



**Figure 21**

In conducting the same analysis for off duty as for on duty mishaps, Figure 21 is similar to Figure 19. There again was a statistically significant increase shift beginning in FY03. However, there is not a spike in FY06 for off duty slip, trip and fall mishaps as there is in the overall mishaps in Figure 16 and the on duty mishap in Figure 19. In addition, the current FY10 off duty slip, trip and fall incident rate is statistically significantly higher than the rates from the previous three years.

It can be concluded that both on and off duty mishaps are contributing factors to the statistically significant increase shift beginning in FY03. On duty mishaps are the contributing factor to the statistically significant spike in FY09.

**NECC**

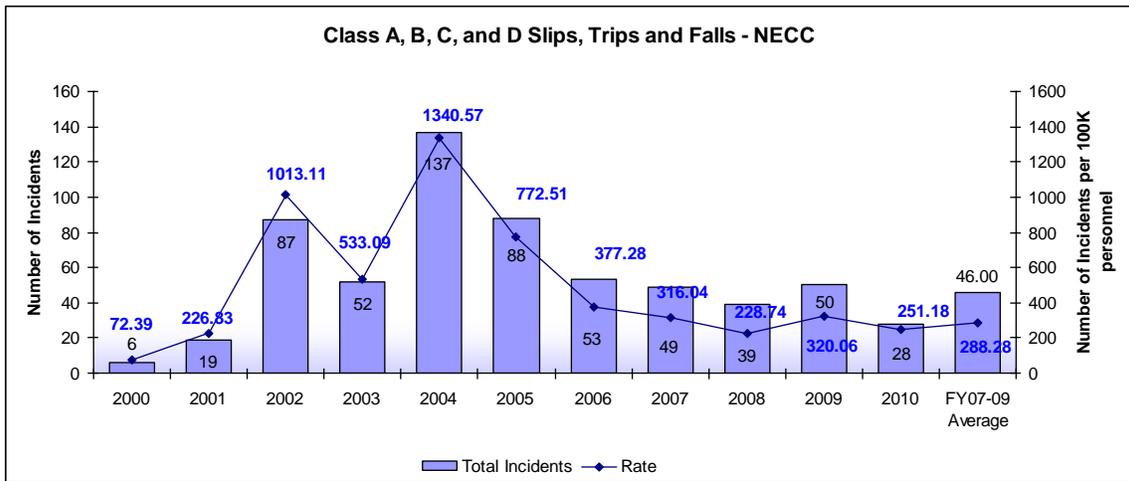


Figure 22

The NECC analysis is much the same as the analyses for the other TYCOMs. Figure 22 graphs the number and rates per 100,000 personnel for slip, trip and fall mishap for NECC from FY00 to present. There seems to be a spike in FY02 and FY04 and the number and rate begin to taper off after the spike in FY04. When statistically comparing the rates from FY02 to FY05 and the rates from FY06 to FY09, the rates from FY06 to FY09 are statistically significant lower than the rates from FY02 to FY05. It can be concluded that there is a decreasing trend beginning in FY06.

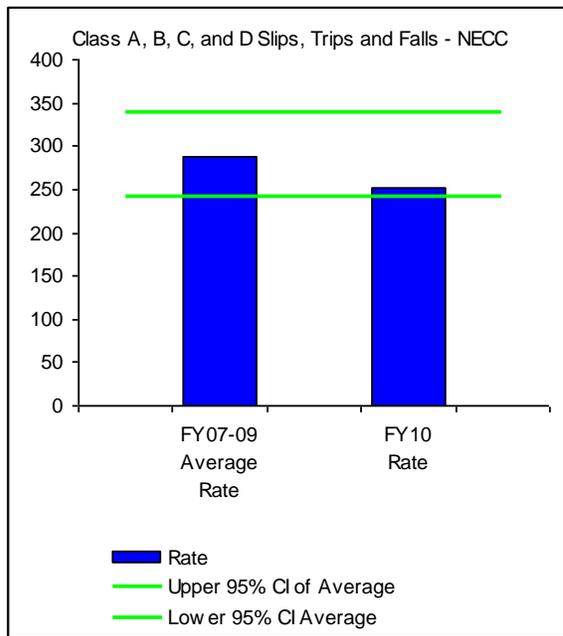


Figure 23

Figure 23 graphs the three year average rate ranging from FY07 to FY09 and the current FY10 slip, trip and fall incident rate for NECC along with the 95% confidence interval depicted by the green lines. The current FY10 rate is within the confidence interval

indicating no statistically significant difference amongst the current FY10 rate and the three years previous rates.

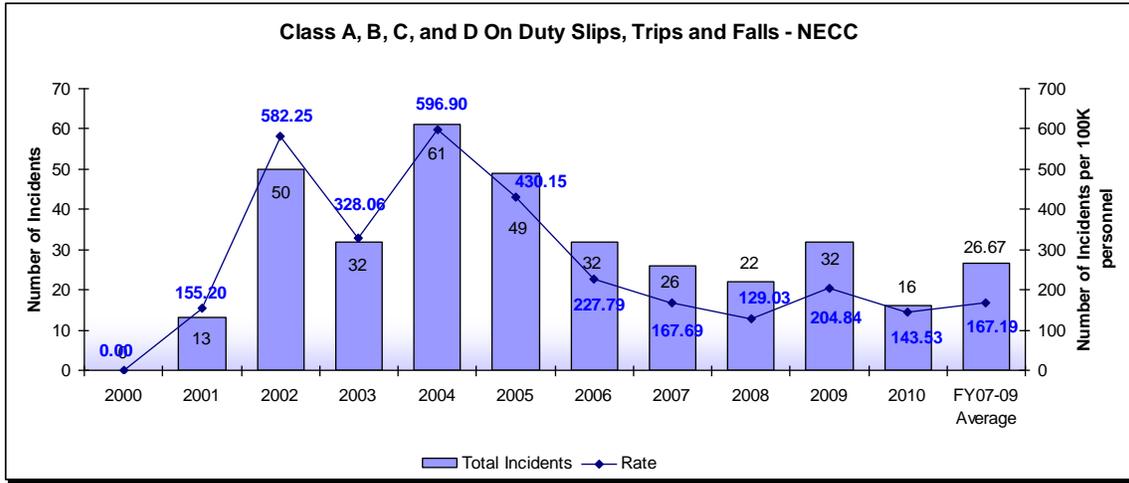


Figure 24

Figure 24 graphs the on duty slip, trip and fall incident numbers and rates per 100,000 personnel from FY00 to present for NECC. Figure 24 tends to mirror Figure 22. As with the overall rates for NECC slip, trip and fall mishaps, there is a decreasing trend starting in FY06.

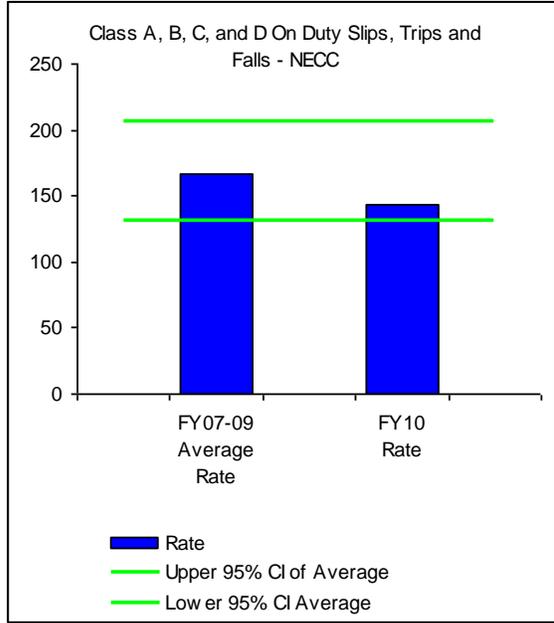


Figure 25

Figure 25 graphs the three year average rate and the current FY10 rate for on duty slip, trip and fall mishaps for NECC along with the 95% confidence interval depicted by the green lines. The current FY10 rate is within the confidence interval indicating no statistically significant difference amongst the current FY10 rate and the previous three years rates.

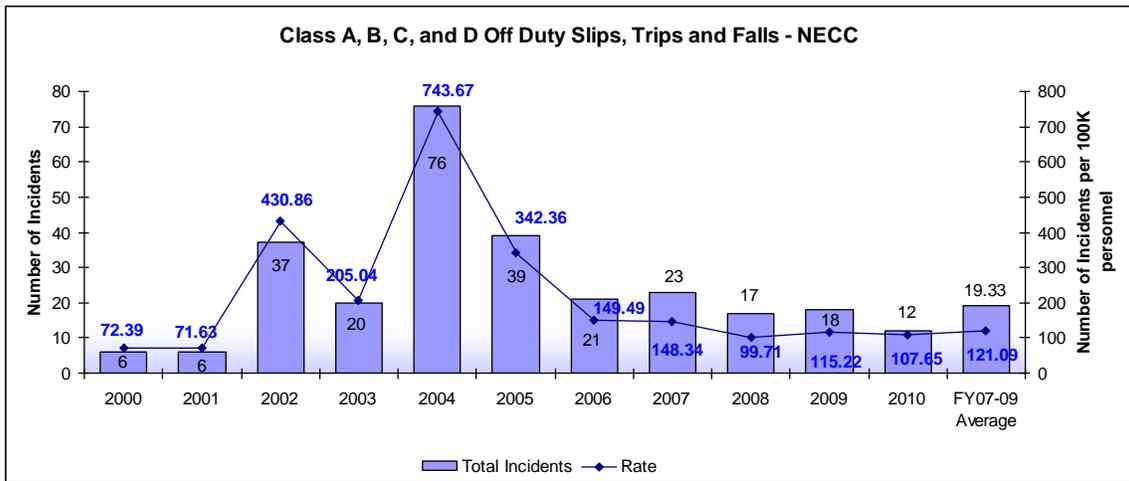


Figure 26

Figure 26 graphs the number and rates for off duty slip, trip and fall mishaps for NECC. Just like the on duty mishaps, the off duty mishap number and rates tend to mirror Figure 22. When statistically comparing the rates from FY02 to FY05 and the rates from FY06 to FY09, again the rates are on a decreasing trend just like the on duty mishaps.

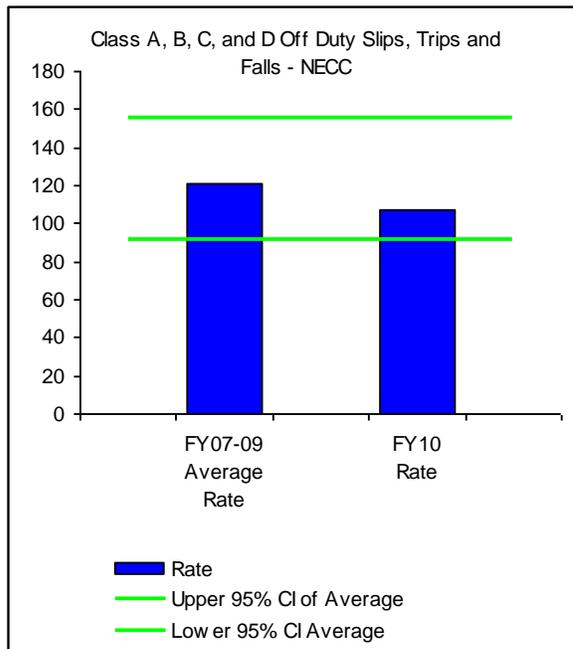


Figure 27

Figure 27 graphs the 3 year average off duty rate and the current FY10 off duty rate along with the 95% confidence interval depicted by the green lines. The FY10 rate is within the confidence interval indicating no statistically significant difference amongst the current FY10 rate and the previous three years rates. This is the same as the on duty mishaps.

## Navy Civilians

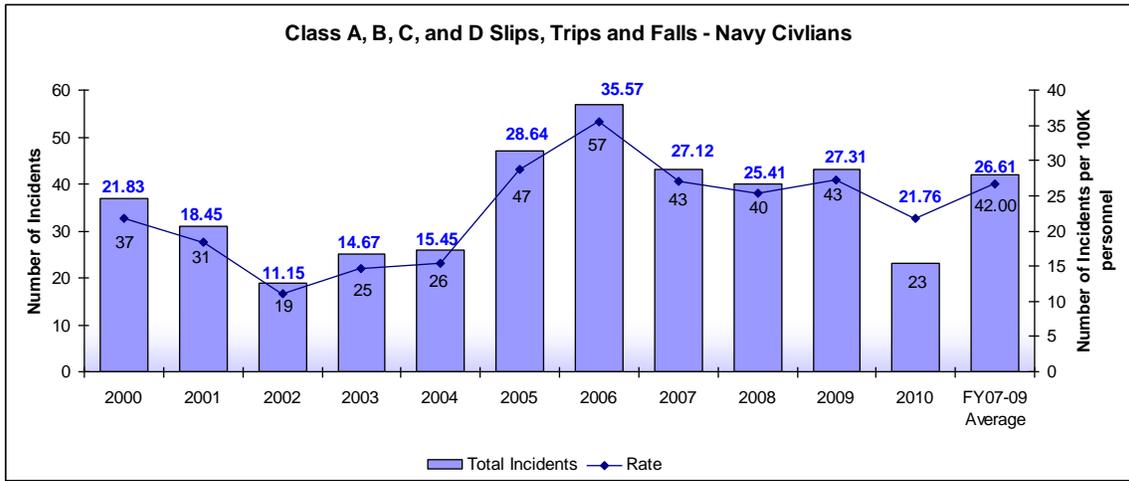


Figure 28

Figure 28 graphs the number and rate of slip, trip and fall incidents for Navy civilians from FY00 to the present. There is an increase in the number of incidents and the rates beginning in FY05. This increase may be due to the introduction of WESS.

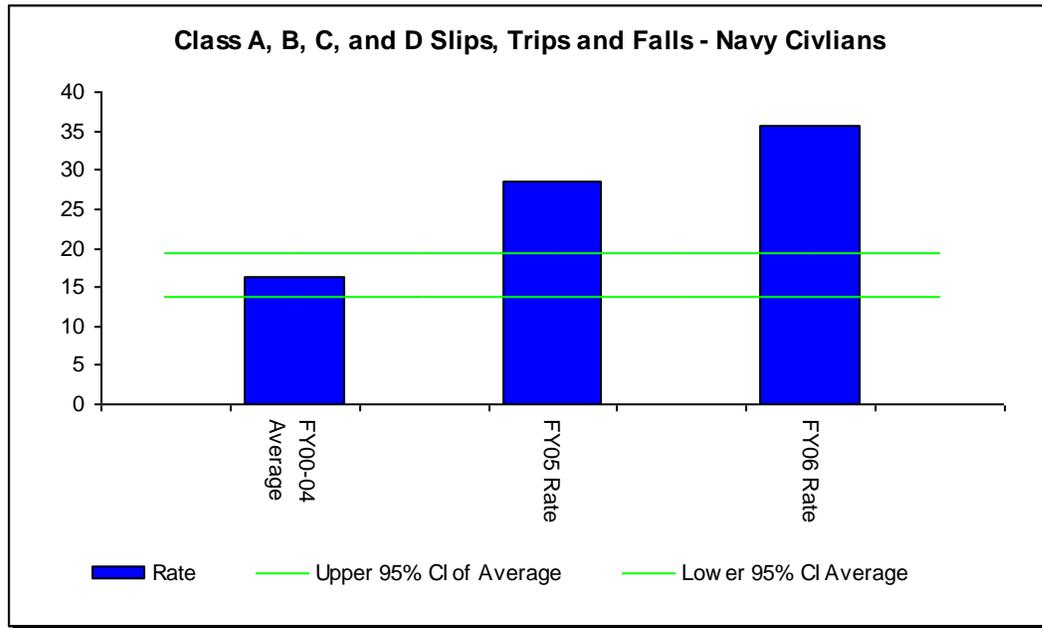
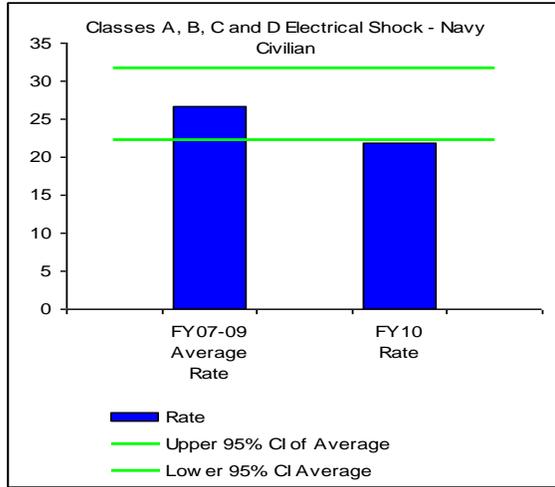


Figure 29

Figure 29 graphs the 5 year average rate ranging from FY00 to FY04, FY05 rate and the FY06 rate along with the 95% confidence interval depicted by the green lines. Both FY05 and FY06 rates are above the confidence interval indicating a statistically significant increase for both fiscal years. It can be concluded that a statistically significant increase shift has occurred in FY05 and the confidence interval will be recalculated.



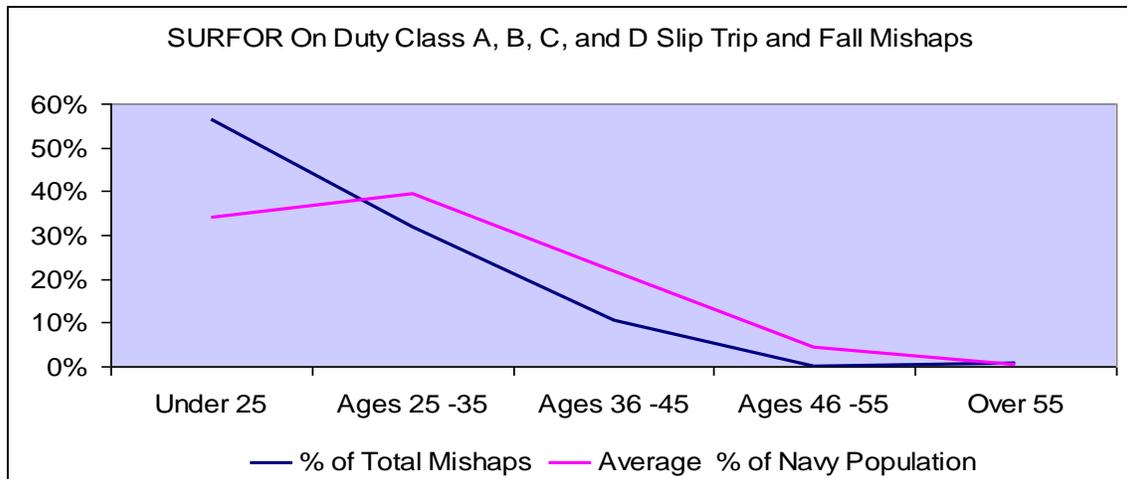
**Figure 30**

The rates from FY06 through FY09 level off and remain relative consistent over that time period. However, there is a dip in the rate in FY10 as is evident in Figure 28. When statistically comparing the current FY10 rate to the previous three years rates, the current FY10 rate is statistically significant lower than the previous three years rates. This can be seen in Figure 30 which graphs the three years average and the current FY10 rate along with 95% confidence interval. The current FY10 rate is just below the confidence interval indicating the current rate is statistically significant lower than the previous three years rates.

### **TYCOM Comparison**

Finally when statistically comparing the slip, trip and fall rates ranging from FY07-09 for each of the TYCOMs, SUBFOR rates are statistically significantly higher than the other TYCOMs and the Navy civilian rates. SURFOR rates are statistically significantly higher than AIRFOR, NECC and the Navy civilian rates.

### **AGE**



**Figure 31**

To further analyze slip, trip and fall mishaps, this study will look at the age of injured Navy personnel. Navy civilian will not be included in the age analysis. Figure 31 graphs the percentage of total SURFOR on duty mishaps along with the average Navy population percentages for the different age groups. The percent of total mishaps for the age of Under-25 years old is above the average percentage of the Navy population. When statistically comparing this age group to the navy population, personnel under the age of 25 have a higher probability of being involved in a slip, trip or fall mishap. To even further breakdown the data, the mishaps are analyzed by event severity classifications. Again the Under-25 age group is above the average percentage of the Navy population. In conclusion, personnel under the age of 25 have a higher probability of being involved in an on duty Class C or D slip, trip and fall mishap.

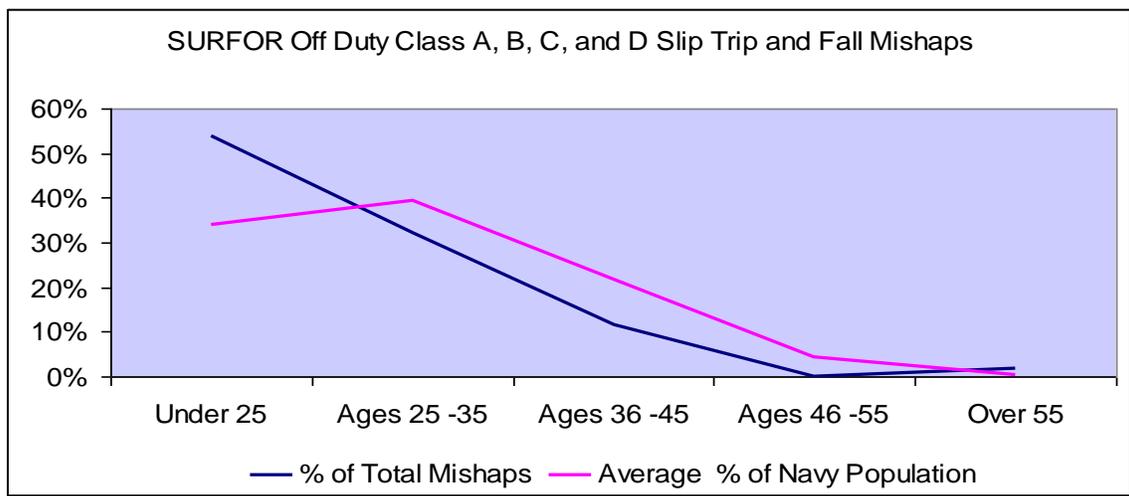


Figure 32

Figure 32 is the same type of graph as Figure 31 only it graphs off duty Class A, B, C and D slip, trip and fall percentage of total mishaps along with the average percentage of the Navy population for each age group over a period ranging from FY05 to present. Figure 32 mirrors Figure 31, with the percentage of total mishaps above the average percentage of the Navy population for the Under-25 age group. The result is the same when statistically comparing the two. As with on duty mishaps, it can be concluded that personnel under the age of 25 have a higher probability of being involved in an off duty slip, trip and fall mishap.

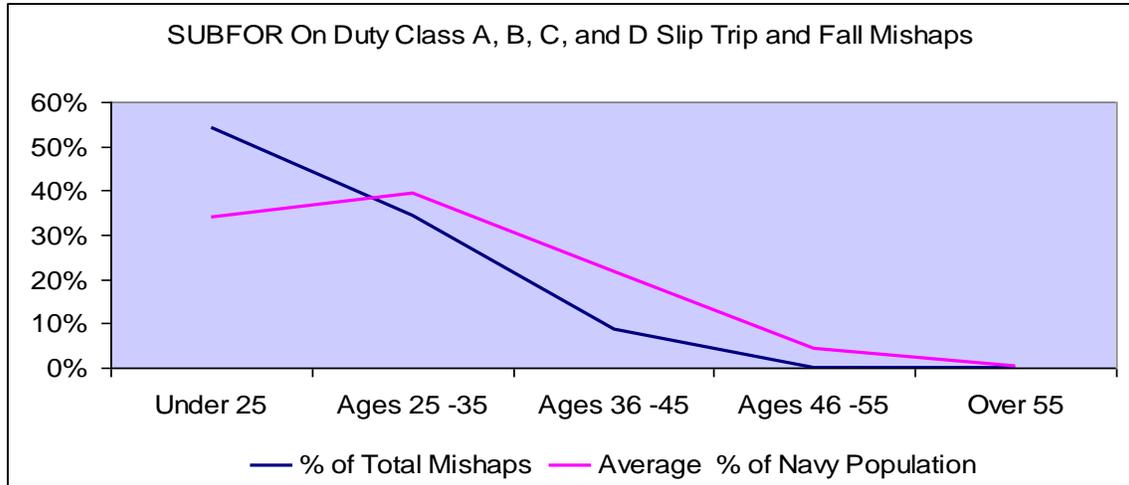


Figure 33

Figure 33 graphs the percentage of total SUBFOR on duty Class A, B, C, and D slip, trip and fall mishaps and the average percentage of the Navy population over a period ranging from FY05 to present. The percentages for SUBFOR are nearly the same as with SURFOR. Over 50% of the on duty slip, trip and fall mishaps involved personnel under the age of 25. Just as with the SURFOR data, the SUBFOR data is statistically significant when compared to the Navy population. Again, the conclusion is the same personnel under the age of 25 have a higher probability of being involved in an on duty slip, trip and fall mishap.

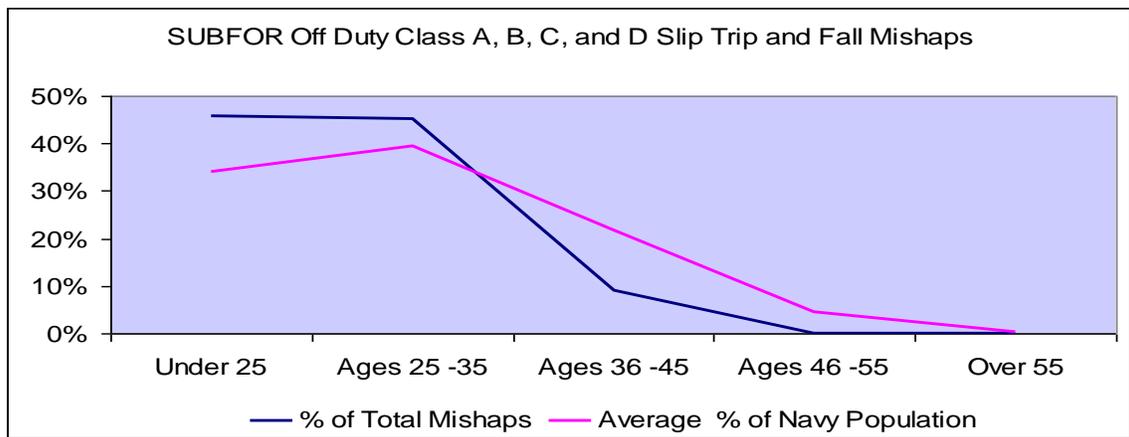


Figure 34

Figure 34 is the same graph as depicted in Figure 33 except it graphs SUBFOR off duty Class A, B, C, and D slip, trip and fall mishaps. This graph differs from the previous graphs for the fact that both ages Under-25 and Ages 25-35 percentage of total mishaps are above the average percentage of the Navy population at those age groups. When statistically comparing the number of mishaps to the navy population for each age group, the conclusion is the same for the personnel under the age of 25 having a higher probability of being involved in an on duty Class A, B, C, or D slip, trip and fall mishap. However, the same conclusion can not be drawn for personnel between the ages of 25 to 35 years old. There is no statistically significant difference amongst the percentage of

total mishaps and the average percentage of the Navy population for personnel between the ages of 25 to 35.

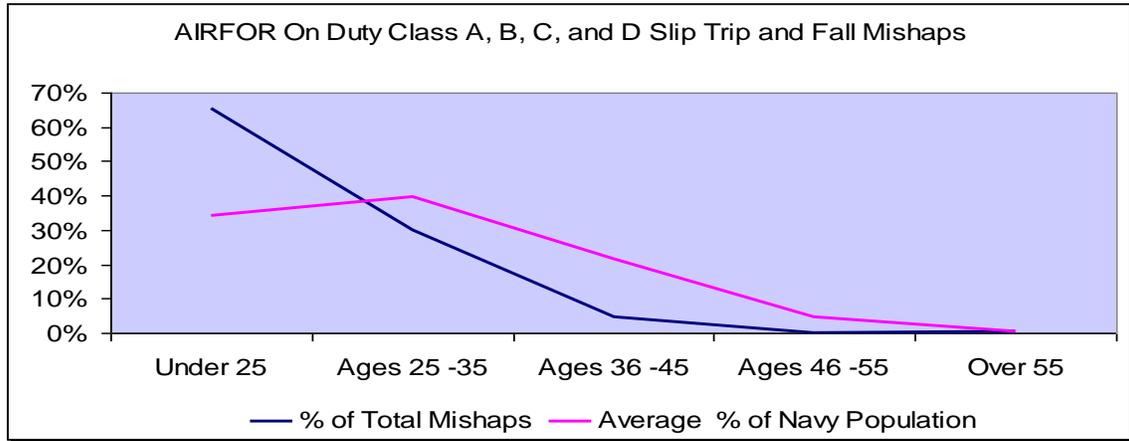


Figure 35

Figure 35 graphs the percentage of total mishaps for AIRFOR on duty slip, trip and fall mishaps and the average percentage of the Navy population per age group over a period ranging from FY05 to the present. Nearly 70% of the total on duty slip, trip and fall mishaps involve personnel under the age of 25. When statistically analyzing the data, just as with the other TYCOMs, personnel under the age of 25 have a higher probability of being involved in an on duty slip, trip and fall mishap.

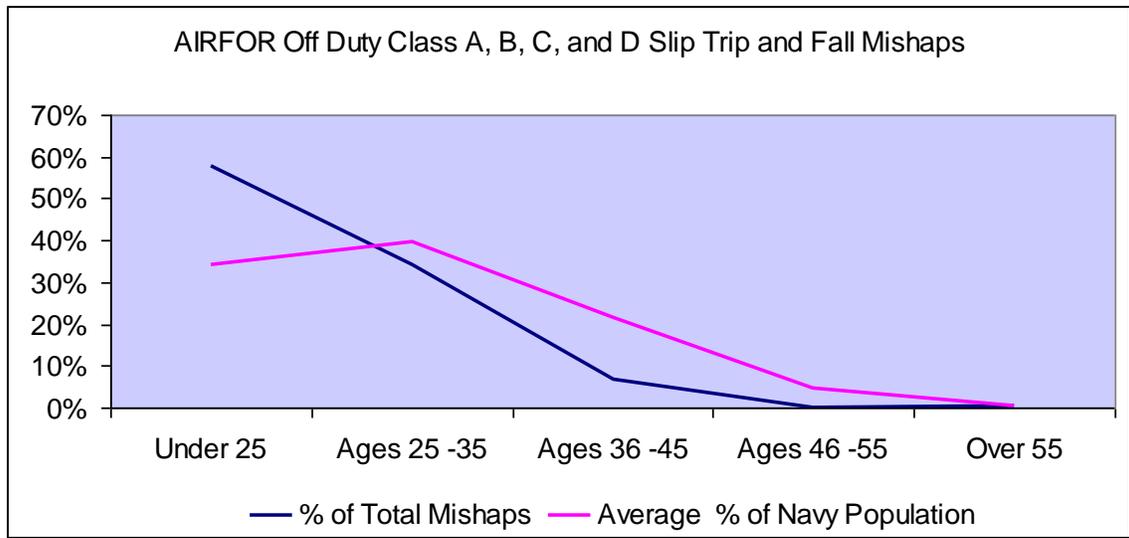
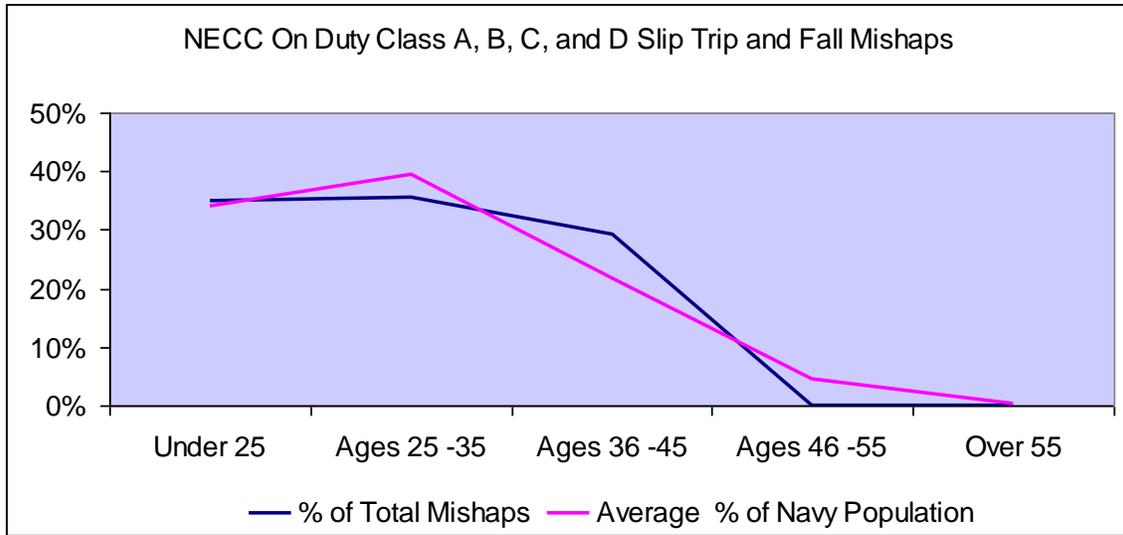


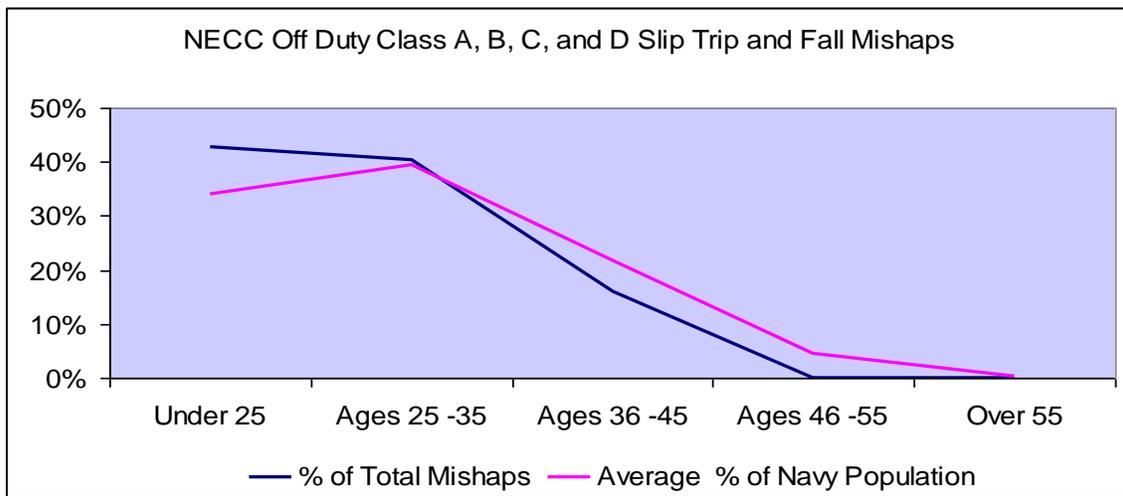
Figure 36

Figure 36 is the same graph as Figure 34 except it graphs off duty mishaps. Again the conclusion is the same. Personnel under the age of 25 have a higher probability of being involved in an off duty slip, trip and fall mishap.



**Figure 37**

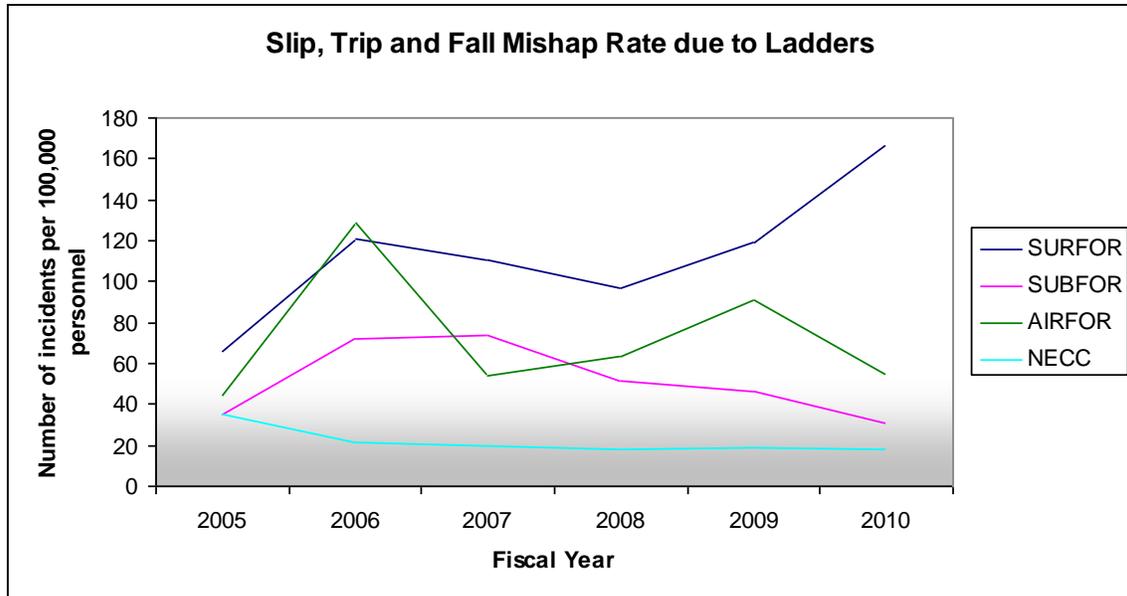
Figure 37 graphs the percent of total on duty slip, trip and fall mishaps for NECC and the average percentage of the Navy population per age group over a period ranging from FY05 to the present. The age group Ages 36-45 is the one age group that is above the average percentage of the Navy population. When statistically analyzing the on duty mishap per age group, personnel between the ages of 36 to 45 have a higher probability of being involved in an on duty slip, trip and fall mishap.



**Figure 38**

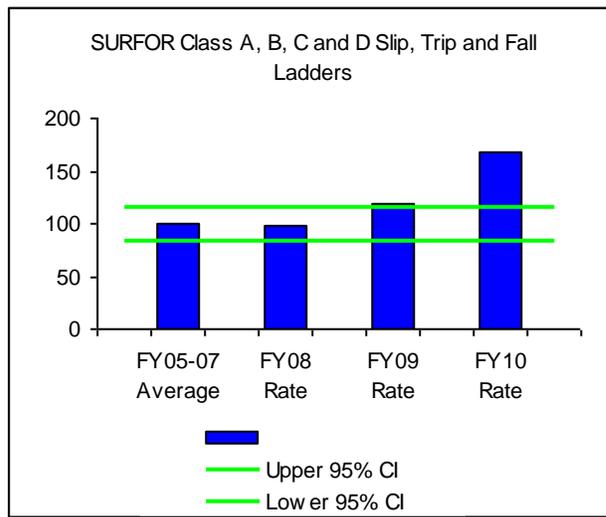
In the same manner as the graph above, Figure 38 graphs the off duty slip, trip and fall mishaps for NECC by age group. The conclusion is the same for NECC as with the other TYCOMS. Personnel under the age of 25 have a higher probability of being involved in an off duty slip, trip and fall mishap.

**Ladders**



**Figure 39**

Figure 39 graphs the rate of incident involving ladders for each TYCOM over a period ranging from FY05 to present. NECC rates tend to remain relatively consistent over the time period. SUBFOR rates tend to be on a decreasing trend. SURFOR rates tend to be on an upward trend starting in FY08. AIRFOR rates are not consistent but tend to fluctuate up and down during this time period. When statistically comparing the rates involving ladder to those that do not involve ladder, the rates involving ladder are statistically significantly lower than those not involving ladders for all four TYCOMs.



**Figure 40**

Figure 40 graphs the SURFOR three year average rate involving ladders ranging from FY05 to FY07, FY08 rate involving ladders, FY09 rate involving ladders and the FY10 rate involving ladders along with the 95% confidence interval calculated using data from FY05 to FY07. The FY09 and the current FY10 rates are both above the confidence interval indicating both rates are statistically significantly higher than the rates from

FY05 to FY07. It can be concluded that there is a statistically significant increase shift beginning in FY09 for slip, trip and fall mishaps involving ladders.

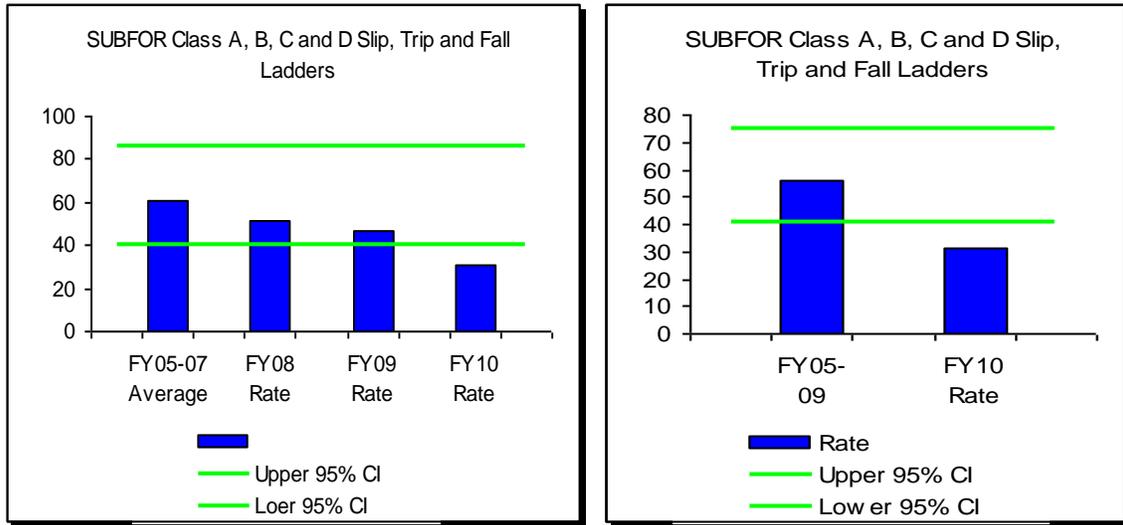


Figure 41

Although SUBFOR rates for slip, trip and fall mishaps involving ladders seems to be on a downward trend in Figure 39, statistically the rates for FY08 and FY09 are not statistically significantly different from the FY05 to FY07 rates. This is evident in the first graph in Figure 41 which graphs the FY05-07 average rate, the FY08, FY09 and the current FY10 rates along with the 95% confidence interval calculated from the FY05 to FY07 data. Both the FY08 and FY09 rates are within the confidence interval indicating no statistically significant difference. The second graph in Figure 41 graphs the 5 year average rate involving ladders and the current FY10 rate along with the 95% confidence interval that is recalculated using the data from FY05 to FY09. In both of the graphs, the current FY10 rate is below the confidence interval indicating the current FY10 is statistically significant lower than the previous rates. This may indicate the beginning of statistically significant shift downward.

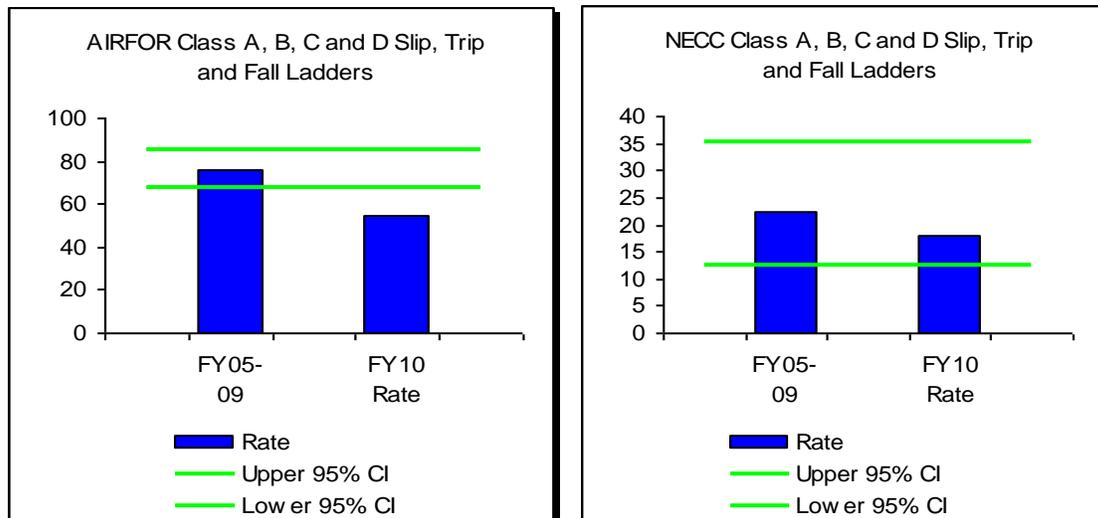


Figure 42

The first graph in Figure 42 shows the 5 year average slip, trip and fall incident rate involving ladders and the current slip, trip and fall incident rate involving ladders along with the 95% confidence interval for AIRFOR. The current FY10 rate is below the confidence interval indicating the current FY10 rate is statistically significantly lower than the rates from the previous years.

The second graph in Figure 42 graphs the rates for NECC in the same manner as the first graph for AIRFOR. The current FY10 slip, trip and fall incident rate involving ladders for NECC is within the confidence interval indicating no statistically significant difference in the FY10 rate and the rates from the previous years.

### Causal Factors

**Table 1: Top Causal Factor Per TYCOM**

<b>PERSONNEL/HUMAN FACTORS</b>	<b>On Duty</b>	<b>Off Duty</b>	<b>Total</b>	<b>% of Total Mishaps</b>
SURFOR	683	406	1089	97%
SUBFOR	104	115	219	93%
AIRFOR	866	869	1735	96%
NECC	166	119	285	93%

The final analysis of this study focuses on the causal factor for each of the slip, trip, and fall mishaps identified in WESS. For all four TYCOMs, Personnel/Human Factors is the causal factor that is identified for over 90% of the total mishaps. Table 1 above lists the number of on duty and off duty slip, trip and fall mishap that have identified Personnel/Human Factors as the causal factor along with the percentage of the total mishaps for which the causal factor is Personnel/Human Factors for each of the TYCOMs.

**Table 2: Personnel/Human Factors Breakdown Percentage of Total Mishaps per TYCOM**

	<b>SURFOR</b>	<b>SUBFOR</b>	<b>AIRFOR</b>	<b>NECC</b>
<b>Lack of Attention to Detail</b>	75%	75%	78%	78%
<b>Unsafe Act</b>	16%	12%	11%	10%

To delve further into the Personnel/Human Factors causal factor, Table 2 lists the top two causal factors broken out from Personnel/Human factors. Lack of Attention to detail and Unsafe Act are the two top causal factors identified for Personnel/Human Factors for all four TYCOMs.