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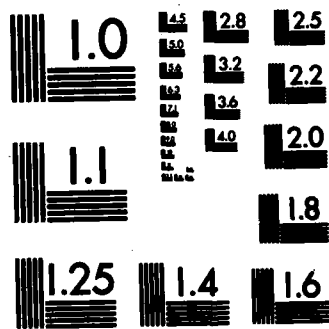
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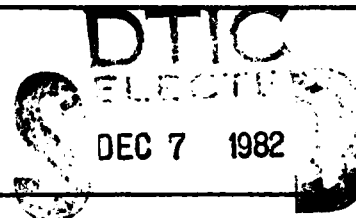
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**Patterns of Personnel Attrition In
Explosive Ordnance Disposal Training**

By

Ann Quigley and Joyce Hogan

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Abstract

Enrollment data for the years 1976 to 1981 from the U.S. Naval School of Explosive Ordnance Disposal are examined and patterns of attrition identified. Attrition increased linearly over time among all enlisted personnel from all services. Attrition rates were significantly higher for paygrades E1, E2 and E3 than for paygrades E4 and above. Diving instruction and the physical training program were the primary sources of Navy attrition, while poor academic performance accounts for most of the attrition of non-Navy personnel. Students who left training voluntarily did not encounter any more difficulties in the curriculum than students who graduated. This indicates that extra-curricular factors may be contributing to attrition. A review of the training curriculum is recommended to identify the antecedents of attrition and to determine possible curriculum revisions to reduce attrition while retaining quality training.

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The selection and retention of qualified personnel is crucial for the efficient operation of any organization. The Armed Forces are no exception. Since the inception of the All Volunteer Force, the problem of meeting manpower requirements has been increasingly important. Two considerations make this process difficult. First, military enlistments are declining thereby limiting personnel availability. Second, there is an increased probability that unqualified individuals may be assigned duties for which they lack the necessary skills, aptitude, or experience.

Although these problems plague all military services, personnel selection and retention is especially critical for positions requiring technical expertise and training, or for positions where there is the possibility of damage or injury. Maintaining sufficient combat forces or qualified enrollments in technical training schools are matters of special concern.

This report examines personnel attrition in technical training at the U.S. Naval Explosive Ordnance Disposal School. We give a brief overview of the school, and identify patterns of attrition. These overall and individual service patterns of attrition are discussed based on enrollment trends for the period 1976 to 1981.

Overview of Explosive Ordnance Disposal School

The purpose of the Explosive Ordnance Disposal (EOD) School is to train personnel to identify, render safe, and dispose of explosive ordnance in any circumstance: on land, underground, underwater, in the air, and in times of peace and war.

Recruiting for the EOD school occurs "in-service" rather than at the time of enlistment. Personnel eligible for EOD training are already serving in the military in some capacity. Enrollment in EOD School is voluntary. Personnel from all armed forces who enter EOD training must meet certain eligibility requirements as designated by the respective services. U.S. Navy requirements include a physical screening test, a medical examination, and a combined score of 110 on the Work Knowledge (WK) and Mechanical Comprehension (MC) subtests of the Armed Services Vocational Aptitude Battery (ASVAB).

Personnel enrolled in EOD training begin Phase I at Redstone Arsenal, Huntsville, AL. During this Phase, students are instructed to identify, render safe, and dispose of chemical and biological agents and munitions. Students in the Navy also participate in a three-week physical training program at Redstone Arsenal prior to the chemical/biological instruction.

At the completion of Phase I, training continues at the U.S. Naval Ordnance Station at Indian Head, Maryland. Navy students begin with diving instruction. All students are instructed in Phases II and III. Phase II involves both classroom and field instruction in basic and advanced techniques of demolition and disposal of Ground and Air Ordnances. In Phase III students are instructed in Nuclear Ordnance, including nuclear physics, nuclear weapons, and radiation. Navy personnel

also complete a course in Underwater Ordnance Disposal. Training for all other students concludes after the Nuclear Ordnance instruction. Those students who complete training successfully graduate from EOD School and are assigned to a detachment as an EOD technician.

Data Base and Definitions

All data presented in this report are based on enrollment information provided by NAVSCOLEOD, Indian Head, MD, and the NAVSCOLEOD Detachment at Redstone Arsenal, Huntsville, AL. This information includes the enrollment date and ultimate status of students at Indian Head for calendar years 1976 to 1981, and at Redstone Arsenal for fiscal year 1981. Data from Phases II and III at Indian Head also include a list of the courses in which students were dropped from the program or were rolled back. Finally, students who voluntarily withdrew from the program are identified. All data in this report refer to enlisted personnel only; no analyses are presented for officer personnel.

For purposes of this report, the following terms and definitions are used to classify NAVSCOLEOD Students:

Input - begin a particular course of EOD training

Ultimate Status - final classification of input as either Graduate,
Drop or Voluntary Withdrawal

Graduate - complete training and graduate from EOD School

Nongraduate - matriculate without graduating due to drop or
voluntary withdrawal

Drop - dismissal prior to completion of EOD training for academic, administrative, or medical reasons

Voluntary Withdrawal (V/W) - leave EOD School voluntarily at any point in the curriculum

Rollback - repeat a course in EOD curriculum because of academic, administrative or medical difficulties

Paygrade - rate/rank equivalent of students enrolled at EOD School

More specific information about these classifications is provided in CNTECHTRAINST 1540.46. No qualitative information concerning attrition classifications of individuals can be made from the source data. Also unknown is the consistency with which these classifications are applied. Although the exact parameters of the source data category labels are not clearly defined, patterns of attrition are still quite apparent and further investigation is recommended.

This report is divided into 8 sections. First, overall rates of attrition are presented. This includes the distribution of graduates, drops, and voluntary withdrawals for all services combined, and each service individually. The second section follows with an examination of attrition and paygrade. In the third section, specific patterns of nongraduation are identified. Reasons given for drops and the distribution of drops and voluntary withdrawals within the EOD School curriculum are presented. The frequency of rollbacks for each attrition category is examined in the fourth section.

These data pertain to that portion of EOD training conducted at Indian Head, Maryland and they are summarized in the fifth section.

Attrition also occurs at Redstone Arsenal, and these data are presented in the sixth section. The attrition figures from Redstone Arsenal are then examined with those compiled for Indian Head to provide estimates of attrition rates for the entire EOD training program. In the final section these findings are summarized and discussed.

Data presented in each section follow a similar format. First, information is given for all services combined. Each service is then discussed separately.

Overview of Attrition Phases II and III, Indian HeadOverview of Attrition 1976-1981, All Services

Attrition data for all services entering Indian Head after successful completion of Phase I of EOD training are presented in Table 1.

Table 1

EOD School Attrition 1976-1981

Indian Head

All Services

<u>YEAR</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
1976	161	83.9	30	15.6	1	0.5	192
1977	244	72.0	60	17.7	35	10.3	339
1978	225	65.6	84	24.5	34	9.9	343
1979	238	70.4	59	17.5	41	12.1	338
1980	257	62.4	90	21.8	65	15.8	412
<u>1981</u>	<u>222</u>	<u>57.1</u>	<u>118</u>	<u>30.3</u>	<u>49</u>	<u>12.6</u>	<u>389</u>
TOTAL	1347	66.9	441	21.9	225	11.2	2013

Approximately two-thirds of the total 2,013 inputs during this time period graduated. Of the nongraduates, 66.2% were dropped and 33.8% voluntarily withdrew. Attrition among EOD students increased linearly over time, as indicated by the decline in graduation rate from 83.9% in 1976 to 57.1% in 1981.

Two general questions are raised. The first is, what factors contributed to the decline in the percentages of graduates over this period? Second, do the patterns of attrition in each service differ from that of all services combined or from each other?

Overview of Attrition 1976-1981: Each Service

In Table 2, the percentages of graduates, drops and voluntary withdrawals are shown for each service. Differences in attrition patterns in the services were inspected using Chi-square tests of independence. Significant differences ($\chi^2 = 95.61$, $p < .001$) in patterns of attrition across services were observed.

Attrition is highest in the Navy, with 61.8% of all inputs graduating. Of nongraduating Navy inputs, approximately 50.0% dropped and 50.0% voluntarily withdrew. The Army has a similar distribution of nongraduates, however the graduation rate of 69.7% is significantly higher ($\chi^2 = 7.67$, $p < .05$) than that of the Navy.

Table 2

EOD School Attrition 1976-1981

Indian Head

<u>SERVICE</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
NAVY	239	61.8	81	20.9	67	17.3	387
ARMY	554	69.7	127	16.0	114	14.3	795
AIR FORCE	476	64.2	223	30.1	42	5.7	741
<u>MARINE CORPS</u>	<u>78</u>	<u>86.7</u>	<u>10</u>	<u>11.1</u>	<u>2</u>	<u>2.2</u>	<u>90</u>
TOTAL	1347	66.9	441	21.9	225	11.2	2013

The Air Force has the second highest rate of attrition with 35.8% of inputs not graduating. The distribution of Air Force nongraduates differs from that of the Army and Navy in that the percentage of Air Force students who were dropped is over five times that of students who voluntarily withdrew.

Students in the Marine Corps graduated at the highest rate. The percentage of drops was much higher than that of voluntary withdrawals. However, these and all Marine Corps data should be interpreted with caution due to the small number of inputs.

Annual rates of attrition are presented for each service in Tables 3-6. An increase of attrition over time occurred in each case. The graduation rate for the Navy declined over 50.0%, from 87.0% in 1976 to 36.5% in 1981. The number of inputs successfully completing EOD training

declined 16.5%, 25.0% and 50.0% for the Army, Air Force, and Marine Corps, respectively, (See Tables 4, 5, 6).

Table 3
EOD School Attrition, Navy Only
Indian Head

<u>YEAR</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
1976	60	87.0	9	13.0	0	0.0	69
1977	70	64.2	21	19.3	18	16.5	109
1978	24	70.6	4	11.8	6	17.6	34
1979	20	83.3	3	12.5	1	4.2	24
1980	42	47.7	21	23.9	25	28.4	88
<u>1981</u>	<u>23</u>	<u>36.5</u>	<u>23</u>	<u>36.5</u>	<u>17</u>	<u>27.0</u>	<u>63</u>
TOTAL	239	61.8	81	20.9	67	17.3	387

Table 4
EOD School Attrition, Army Only
Indian Head

<u>YEAR</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
1976	33	84.6	6	15.4	0	0.0	39
1977	89	78.1	19	16.7	6	5.2	114
1978	115	66.9	36	20.9	21	12.2	172
1979	86	64.2	17	12.7	31	23.1	134
1980	120	69.4	25	14.4	28	16.2	173
<u>1981</u>	<u>111</u>	<u>68.1</u>	<u>24</u>	<u>14.7</u>	<u>28</u>	<u>17.2</u>	<u>163</u>
TOTAL	554	69.7	127	16.0	114	14.3	795

Table 5

EOD School Attrition, Air Force Only

Indian Head

<u>YEAR</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
1976	61	79.2	15	19.5	1	1.3	77
1977	77	71.3	20	18.5	11	10.2	108
1978	68	57.6	43	36.4	7	5.9	118
1979	104	69.3	37	24.7	9	6.0	150
1980	82	61.7	41	30.8	10	7.5	133
<u>1981</u>	<u>84</u>	<u>54.2</u>	<u>67</u>	<u>43.2</u>	<u>4</u>	<u>2.6</u>	<u>155</u>
TOTAL	476	64.2	223	30.1	42	5.7	741

Table 6

EOD School Attrition, Marine Corps Only

Indian Head

<u>YEAR</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
1976	7	100.0	0	0.0	0	0.0	7
1977	8	100.0	0	0.0	0	0.0	8
1978	18	94.7	1	5.3	0	0.0	19
1979	28	93.3	2	6.7	0	0.0	30
1980	13	72.2	3	16.7	2	11.1	18
<u>1981</u>	<u>4</u>	<u>50.0</u>	<u>4</u>	<u>50.0</u>	<u>0</u>	<u>0.0</u>	<u>8</u>
TOTAL	78	86.7	10	11.1	2	2.2	90

Attrition and Paygrade, Phases II & III, Indian HeadAttrition and Paygrade at Indian Head, All Services

The percentages of graduates, drops, and voluntary withdrawals for all services by paygrade are shown in Table 7. Differences between paygrades in rate of attrition are highly significant ($\chi^2 = 95.59$, $p < .001$). Attrition decreases linearly with increasing paygrade. Less than 50.0% of E1's successfully completed training; however, 74.5% of E5's graduated. The ratio of drops to voluntary withdrawals is also higher in the lower paygrades.

When dichotomized into low (E1, E2, E3) and high (E4 and above) paygrade groups, attrition for all services is shown in Table 8. The two groups differed significantly ($\chi^2 = 62.04$, $p < .001$) in rates of attrition. The low paygrade group graduated at a rate of 58.2%. The rate of drops in this group was almost three times the rate of voluntary withdrawals. The higher paygrade group graduated at a rate of 72.3%. The percentage of drops in this group exceeded that of voluntary withdrawals by only 5.0%.

The two paygrade groups voluntarily withdrew at approximately equal rates, however the members of the low group were dropped at almost twice the rate of the high group.

Table 7

EOD School Attrition, All Services by Paygrade

Indian Head

<u>PAYGRADES</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
E1	64	44.1	61	42.1	20	13.8	145
E2	131	60.1	60	27.5	27	12.4	218
E3	250	62.2	117	29.1	35	8.7	402
E4	400	68.5	116	19.9	68	11.6	584
E5	372	74.5	64	12.8	63	12.6	499
E6	108	77.7	19	13.7	12	8.6	139
E7	17	81.0	4	19.0	0	0.0	21
<u>E8</u>	<u>5</u>	<u>100.0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>	<u>5</u>
TOTAL	1347	66.9	441	21.9	225	11.2	2013

Table 8

Attrition, All Services, Paygrades E1-E3 and E4-E8

<u>PAYGRADES</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
E1-E3	445	58.2	238	31.1	82	10.7	765
<u>E4-E8</u>	<u>902</u>	<u>72.3</u>	<u>203</u>	<u>16.3</u>	<u>143</u>	<u>11.4</u>	<u>1248</u>
TOTALS	1347	66.9	441	21.9	225	11.2	2013

Attrition and Paygrade at Indian Head, Each Service

Attrition by paygrade is presented for each service in Tables 9 through 12. Linear decreases in attrition with paygrade increase occurred in each service. This is a clear trend for the Navy (Table 9). No E1's and only 25.7% of E2's in the Navy successfully completed EOD training. The rate of graduation increased to 69.2% for E5's and 76.6% for E6's. The number of E7's and E8's is small but it is clear that attrition decreases with increasing paygrade.

Table 9

Navy Attrition by Paygrade, Indian Head

<u>PAYGRADES</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
E1	0	0.0	3	60.0	2	40.0	5
E2	9	25.7	11	31.4	15	42.9	35
E3	13	37.1	11	31.4	11	31.4	35
E4	44	57.1	21	27.3	12	15.6	77
E5	81	69.2	18	15.4	18	15.4	117
E6	72	76.6	13	13.8	9	9.6	94
E7	15	78.9	4	21.1	0	0.0	19
<u>E8</u>	<u>5</u>	<u>100.0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>	<u>5</u>
TOTAL	239	61.8	81	20.9	67	17.3	387

Table 10

Army Attrition by Paygrade, Indian Head

<u>PAYGRADES</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
E2	10	66.7	3	20.0	2	13.3	15
E3	69	58.5	26	22.0	23	19.5	118
E4	258	68.1	72	19.0	49	12.9	379
E5	207	76.4	26	9.6	38	14.0	271
<u>E6</u>	<u>10</u>	<u>83.3</u>	<u>0</u>	<u>0.0</u>	<u>2</u>	<u>16.7</u>	<u>12</u>
TOTAL	554	69.7	127	16.0	114	14.3	795

Table 11

Air Force Attrition by Paygrade, Indian Head

<u>PAYGRADES</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
E1	62	44.9	58	42.0	18	13.0	138
E2	112	67.1	45	26.9	10	6.0	167
E3	158	66.1	80	33.5	1	0.4	239
E4	84	77.1	19	17.4	6	5.5	109
E5	42	66.7	15	23.8	6	9.5	63
<u>E6</u>	<u>18</u>	<u>72.0</u>	<u>6</u>	<u>24.0</u>	<u>1</u>	<u>4.0</u>	<u>25</u>
TOTAL	476	64.2	223	30.1	42	5.7	741

Table 12

Marine Corps Attrition by Paygrade, Indian Head

<u>PAYGRADES</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
E1	2	100.0	0	100.0	0	0.0	2
E2	0	0.0	1	100.0	0	0.0	1
E3	10	100.0	0	0.0	0	0.0	10
E4	14	73.7	4	21.0	1	5.3	19
E5	42	87.5	5	10.4	1	2.1	48
E6	8	100.0	0	0.0	0	0.0	8
<u>E7</u>	<u>2</u>	<u>100.0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>	<u>2</u>
TOTAL	78	86.7	10	11.1	2	2.2	90

Similar trends occurred with Army personnel, where 66.7% of E2's and 83.3% of E6's graduated. In the Air Force, less than 50.0% of the E1's successfully completed training while 66.1% or more of E4's and above graduated. The number of inputs in the Marine Corps is too small to establish any reliable patterns.

Attrition by Low and High Paygrade Groups at Indian Head, Each Service

Attrition data for the low and high paygrade groups for each service appear in Tables 13 to 16. With the exception of the Marine Corps, the low and high paygrade groups differ significantly in rates of attrition.

Differences between the paygrade groups presented in Table 13 are for the Navy and these are significant ($\chi^2 = 44.21$, $p < .001$). E3's and below graduated at a rate of 29.3%, while E4's and above graduated at a rate of 69.6%--a difference of over 100.0%. The lower paygrade personnel were dropped at a much greater rate than higher paygrade personnel. Lower paygrade personnel also voluntarily withdrew at a rate three times that of personnel in the higher paygrades.

Table 13

Navy Attrition: Paygrades E1-E3 and E4-E8, Indian Head

<u>PAYGRADES</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
E1-E3	22	29.3	25	33.3	28	37.3	75
E4-E8	<u>217</u>	<u>69.6</u>	<u>56</u>	<u>17.9</u>	<u>39</u>	<u>12.5</u>	<u>312</u>
TOTAL	239	61.8	81	20.9	67	17.3	387

Army attrition data by paygrade group are presented in Table 14. These differences are also significant ($\chi^2 = 8.04$, $p < .05$). The Army high paygrade personnel graduated at a rate of 71.8%, exceeding the low paygrade group graduation rate by 12.4%. Drops and voluntary withdrawals occurred at approximately equal rates within each group.

Table 14

Army Attrition: Paygrades E1-E3 and E4-E8, Indian Head

<u>PAYGRADES</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
E1-E3	79	59.4	29	21.8	25	18.8	133
<u>E4-E8</u>	<u>475</u>	<u>71.8</u>	<u>98</u>	<u>14.8</u>	<u>89</u>	<u>13.4</u>	<u>662</u>
TOTAL	554	69.7	127	16.0	114	4.3	795

In the Air Force (Table 15, $\chi^2 = 12.23$, $p < .01$), the graduation rate of the higher paygrade group exceeded that of the lower paygrade group by 12.1%. In the lower paygrade group, drops were over six times more frequent than voluntary withdrawals. Drops occurred approximately three times as often as voluntary withdrawals in the higher paygrade group.

Table 15

Air Force Attrition: Paygrades E1-E3 and E4-E8, Indian Head

<u>PAYGRADES</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
E1-E3	332	61.0	183	33.6	29	5.3	544
<u>E4-E8</u>	<u>144</u>	<u>73.1</u>	<u>40</u>	<u>20.3</u>	<u>13</u>	<u>6.6</u>	<u>197</u>
TOTAL	476	64.2	223	30.1	42	5.7	741

No significant differences were found for the Marine Corps (Table 16).

Table 16

Marine Corps Attrition: Paygrades E1-E3 and E4-E8, Indian Head

<u>PAYGRADES</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
E1-E3	12	92.3	1	7.7	0	0.0	13
<u>E4-E8</u>	<u>66</u>	<u>86.7</u>	<u>9</u>	<u>11.7</u>	<u>2</u>	<u>2.6</u>	<u>77</u>
TOTAL	78	86.7	10	11.1	2	2.2	90

Since the attrition rate for the lower paygrades is greater than that of the higher paygrades, it was of interest to examine attrition patterns of E1's, E2's, and E3's. Table 17 presents the attrition statistics for the low paygrade personnel group by year ($\chi^2 = 44.4$, $p < .001$). With the exception of 1976 when the number of inputs was lowest, less than 2/3 of this group graduated each year. For each year, the percentage of drops is much higher than the percentages of voluntary withdrawals. Also, the number of individuals enrolling in EOD School from the lower paygrades increased. The percentage of total inputs from this group has increased steadily from 27.6% in 1976 to 41.9% in 1981.

Table 17

EOD School Attrition: Paygrades E1, E2, E3, All Services

Indian Head

<u>YEAR</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>	<u>% INPUTS THAT YEAR</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>		
1976	43	81.1	9	17.0	1	1.9	53	27.6
1977	64	61.5	25	24.0	15	14.4	104	30.7
1978	73	56.6	48	37.2	8	6.2	129	37.6
1979	91	65.9	34	24.6	13	9.4	138	40.8
1980	90	50.6	55	30.9	33	18.5	178	43.2
<u>1981</u>	<u>84</u>	<u>51.5</u>	<u>67</u>	<u>41.1</u>	<u>12</u>	<u>7.4</u>	<u>163</u>	<u>41.9</u>
TOTAL	445	58.2	238	31.1	82	10.7	765	38.0

This suggests that the combination of higher attrition rates of the lower paygrades and the increased proportion of this group in terms of total inputs each year may be responsible in part for the general increase in attrition.

Similar information for personnel in paygrades E4 and above are presented in Table 18. Attrition in this group has also increased significantly ($\chi^2 = 34.75$, $p < .001$). The graduation rate for this group declined from a high of 84.9% in 1976 to a low of 61.1% in 1981. This indicates that other factors in addition to the increased number of inputs from the lower paygrades are contributing to the overall increase in attrition in EOD training.

Table 18

EOD School Attrition: Paygrades E4, E5, E6, E7, E8, All Services

Indian Head

<u>YEAR</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>	<u>% INPUTS THAT YEAR</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>		
1976	118	84.9	21	15.1	0	0.0	139	72.4
1977	180	76.6	35	14.9	20	8.5	235	69.3
1978	152	71.0	36	16.8	26	12.1	214	62.4
1979	147	73.5	25	12.5	28	14.0	200	59.2
1980	167	71.4	35	14.9	32	13.7	234	56.8
<u>1981</u>	<u>138</u>	<u>61.1</u>	<u>51</u>	<u>22.6</u>	<u>37</u>	<u>16.4</u>	<u>226</u>	<u>58.1</u>
TOTAL	902	72.3	203	16.3	143	11.4	1248	62.0

Nongraduating Inputs, Phases II and III, Indian HeadDistribution of Nongraduates in the EOD School Curriculum at Indian Head

In this section, the specific patterns of nongraduation are examined. Reasons given for drops and the distribution of drops and voluntary withdrawals in the EOD curriculum are identified.

Reasons given for drops are listed in Table 19. Academic reasons account for 78.5% of all drops. The percentage of drops for medical and administrative reasons are approximately equal. Personnel in paygrade E4 had the highest percentage of academic drops, E3's the most administrative drops, E1's and E6's the most medical drops.

Table 19

Type of Drops, All Services

Indian Head

<u>PAYGRADES</u>	<u>ACADEMIC</u>		<u>ADMIN.</u>		<u>MEDICAL</u>		<u>OTHER*</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
E1	44	72.1	2	3.3	15	24.6	0	0.0	61
E2	45	75.0	5	8.3	10	16.7	0	0.0	60
E3	91	77.8	19	16.2	5	4.3	2	1.7	117
E4	100	86.2	11	9.5	5	4.3	0	0.0	116
E5	52	81.2	7	10.9	4	6.2	1	1.6	64
E6	11	57.9	1	5.3	7	36.8	0	0.0	19
E7	3	75.0	0	0.0	1	25.0	0	0.0	4
<u>E8</u>	<u>0</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
TOTAL	346	78.5	45	10.2	47	10.7	3	0.6	441

*No reason given

Table 20 lists the distribution of drops for all paygrades by service. The majority of drops occurred for academic reasons in all services, from 66.7% of Navy drops to 89.7% of Army drops. This suggests that an examination of the distribution of drops in the academic curriculum may provide insights for attrition reduction.

Table 20

Types of Drops by Service

Indian Head

<u>SERVICE</u>	<u>ACADEMIC</u>		<u>ADMIN.</u>		<u>MEDICAL</u>		<u>OTHER*</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
NAVY	54	66.7	9	11.1	16	19.7	2	2.5	81
ARMY	114	89.7	9	7.1	4	3.1	0	0.0	127
AIR FORCE	170	76.2	25	11.2	27	12.1	1	0.5	223
<u>MARINE CORPS</u>	<u>8</u>	<u>80.0</u>	<u>2</u>	<u>20.0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>	<u>10</u>
TOTAL	346	78.5	45	10.2	47	10.7	3	0.6	441

*No reason given

Distribution of Drops in the EOD School Curriculum at Indian Head

The distribution of drops within the EOD curriculum for all services by paygrade is presented in Table 21. For all services combined, drops occurred at the highest rate, 30.8%, in the Core course of instruction. Drops occurred at a similar rate, 29.0% in the Air Ordnance course, while 24.3% of drops occurred in the Ground Ordnance course of instruction.

Table 21

Drops Within EOD Curriculum, All Services

Course

<u>PAYGRADE</u>	<u>DIVING</u> N	<u>z</u>	<u>CORE</u> N	<u>z</u>	<u>DEMO.</u> N	<u>z</u>	<u>GROUND</u> N	<u>z</u>	<u>AIR</u> N	<u>z</u>	<u>NUCLEAR</u> N	<u>z</u>	<u>UWO</u> N	<u>z</u>	<u>TOTAL</u>
E1	3	4.9	22	36.1	1	1.6	14	23.0	20	32.8	1	1.6	0	0.0	61
E2	7	11.7	14	23.3	0	0.0	18	30.0	18	30.0	3	5.0	0	0.0	60
E3	5	4.3	51	43.6	7	6.0	24	20.5	27	23.1	3	2.6	0	0.0	117
E4	4	3.4	30	25.9	8	6.9	33	28.4	38	32.8	1	0.9	2	1.7	116
E5	7	10.9	15	23.4	5	7.8	14	21.9	21	32.8	2	3.1	0	0.0	64
E6	5	26.3	4	21.1	0	0.0	4	21.1	4	21.1	0	0.0	2	10.5	19
E7	3	75.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	25.0	4
TOTAL	34	7.7	136	30.8	21	4.8	107	24.3	128	29.0	10	2.3	5	1.1	441
CUM. % ATTRITION		7.7		38.5		43.3		67.6		96.6		98.9		100.0	

Since only Navy students participate in the Diving and Underwater Ordnance courses, it is appropriate to examine the distribution of drops in each service. Table 22 presents the drops within EOD curriculum by service excluding those drops occurring in courses unique to the Navy.

Similar to data for all services combined, drops in each service occurred at the highest rates in the Core, Ground Ordnance and Air Ordnance courses. Approximately ninety percent of all drops occurred in these three courses with the exception of those drops in courses unique to Navy students. The Demolition and Nuclear Ordnance courses accounted for the remaining 10.4% of all drops.

Table 22

Drops Within EOD Curriculum

Excluding courses Unique to Navy Personnel

Indian Head

<u>SERVICE</u>	<u>CORE</u>		<u>DEMO.</u>		<u>GROUND</u>		<u>AIR</u>		<u>NUCLEAR</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
NAVY	13	33.9	1	2.4	16	38.1	10	23.8	2	4.8	127
ARMY	36	28.3	14	11.0	37	29.1	39	30.7	1	0.8	223
AIR FORCE	83	37.2	5	2.2	52	23.3	77	34.5	6	2.7	10
<u>MARINE CORP</u>	<u>4</u>	<u>40.0</u>	<u>1</u>	<u>10.0</u>	<u>2</u>	<u>20.0</u>	<u>2</u>	<u>20.0</u>	<u>1</u>	<u>10.0</u>	<u>42</u>
TOTAL	136	33.8	21	5.2	107	26.6	128	31.8	10	2.5	402

Distribution of Drops, Navy Personnel Only

Due to the unique nature of the additional courses taken by Navy students, it is necessary to examine Navy drops separately from the other services. A complete listing of drops for the Navy appears in Table 23. Although drops from Diving accounted for only 7.7% of all drops, that is, for all services combined, 42.0% of all drops in the Navy occurred during Diving instruction. An additional 19.8% of Navy drops occurred during Ground instruction and 16.0% in the Core course. Therefore 77.8% of all Navy drops occurred in these three courses.

Table 23

Drops Within EOD Curriculum, Navy Personnel Only

<u>COURSE</u>	<u>NO. OF DROPS</u>	<u>% NAVY DROPS</u>	<u>CUM. % DROPS</u>
DIVING	34	42.0	42.0
CORE	13	16.0	58.0
DEMOLITION	1	1.2	59.2
GROUND	16	19.8	79.0
AIR	10	12.3	91.3
NUCLEAR	2	2.5	93.8
<u>UWO</u>	<u>5</u>	<u>6.2</u>	<u>100.0</u>
TOTAL	81	100.0	100.0

Distribution of Voluntary Withdrawals in EOD School Curriculum

Voluntary withdrawals by paygrade within the EOD curriculum for all services are tabulated in Table 24. Although only Navy students participate in Diving, 23.6% of all voluntary withdrawals occurred in this course. The highest rate of voluntary withdrawals, 36.0%, occurred in the Core course. Therefore, 59.6% of all voluntary withdrawals occurred in the first two courses of instruction.

Table 24

Voluntary Withdrawals Within the EOD Curriculum, All Services

Indian Head

Course

<u>PAYGRADE</u>	<u>DIVING</u> N	<u>%</u>	<u>CORE</u> N	<u>%</u>	<u>DEMO.</u> N	<u>%</u>	<u>GROUND</u> N	<u>%</u>	<u>AIR</u> N	<u>%</u>	<u>NUCLEAR</u> N	<u>%</u>	<u>UWO</u> N	<u>%</u>	<u>TOTAL</u>
E1	2	10.0	11	55.0	1	5.0	6	30.0	0	0.0	0	0.0	0	0.0	20
E2	15	55.6	5	18.5	1	3.7	5	18.5	1	3.7	0	0.0	0	0.0	27
E3	7	20.0	16	45.7	0	0.0	10	28.6	2	5.7	0	0.0	0	0.0	35
E4	9	13.2	30	44.1	6	8.8	11	16.2	12	17.6	0	0.0	0	0.0	68
E5	12	19.0	19	30.2	9	14.3	10	15.9	12	19.0	1	1.6	0	0.0	63
E6	8	66.7	0	0.0	1	8.3	2	16.7	1	8.3	0	0.0	0	0.0	12
TOTAL	53	23.6	81	36.0	18	8.0	44	19.6	28	12.4	1	0.4	0	0.0	225
CUM. % ATTRITION	23.6		59.6		67.6		87.2		99.6		100.0		100.0		

Voluntary withdrawals within the EOD curriculum excluding those occurring in the Diving and Underwater Ordnance courses are shown in Table 25. With the exception of the Marine Corps, voluntary withdrawals occurred in the highest rate in the Core course, followed by the Ground Ordnance and Air Ordnance courses.

Table 25

Voluntary Withdrawals Within EOD Curriculum

Excluding courses Unique to Navy Personnel

Indian Head

<u>SERVICE</u>	<u>CORE</u>		<u>DEMO.</u>		<u>GROUND</u>		<u>AIR</u>		<u>NUCLEAR</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
NAVY	10	71.4	0	0.0	3	21.4	1	7.1	0	0.0	14
ARMY	47	41.2	15	13.2	29	25.4	22	19.3	1	0.9	114
AIR FORCE	23	54.8	2	4.8	12	28.5	5	11.9	0	0.0	42
<u>MARINE CORPS</u>	<u>1</u>	<u>50.0</u>	<u>1</u>	<u>50.0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>	<u>0.0</u>	<u>2</u>
TOTAL	81	47.1	18	10.5	44	25.6	28	16.3	1	0.6	172

Distribution of Voluntary Withdrawals, Navy Personnel Only

Voluntary withdrawals in the Navy including Diving and Underwater Ordnance instruction appear in Table 26. Of all voluntary withdrawals by Navy Personnel, 79.1% occurred during Diving instruction. An additional 14.9% occurred in Core instruction. Therefore, 94.0% of all Navy voluntary withdrawals at Indian Head occurred during the first two courses of instruction.

Table 26

Voluntary Withdrawals Within EOD School Curriculum, Navy Only
Indian Head

<u>COURSE</u>	<u>NO. V/W</u>	<u>% NAVY V/W</u>	<u>CUM. % V/W</u>
DIVING	53	79.1	79.1
CORE	10	14.9	94.0
DEMOLITION	0	0.0	94.0
GROUND	3	4.5	98.5
AIR	1	1.5	100.0
NUCLEAR	0	0.0	100.0
<u>UWO</u>	<u>0</u>	<u>0.0</u>	<u>100.0</u>
TOTAL	67	100.0	100.0

Distribution of Nongraduates in EOD School Curriculum at Indian Head:Summary

Table 27 summarizes the attrition data within the EOD curriculum for all services. The cumulative percentage of attrition is given in the last column of the Table. Of all attrition occurring at Indian Head, 51.5% took place in the first 3 courses of instruction. Seventy-five percent of all attrition occurred prior to the end of the fourth course of instruction and 97.6% occurred before Phase III.

Table 27
Drops and Voluntary Withdrawals Within the EOD Curriculum
All Services

<u>COURSE</u>	<u>#</u> <u>DROPS</u>	<u>% ALL</u> <u>DROPS</u>	<u>CUM %</u> <u>DROPS</u>	<u>#</u> <u>V/W</u>	<u>% ALL</u> <u>V/W</u>	<u>CUM %</u> <u>V/W</u>	<u>#</u> <u>DROPS</u> <u>& V/W</u>	<u>% TOTAL</u> <u>ATTRITION</u>	<u>CUM. %</u> <u>ATTRITION</u>
DIVING	34	7.7	7.7	53	23.6	23.6	87	13.1	13.1
CORE	136	30.8	38.5	81	36.0	59.6	217	32.6	45.7
DEMO.	21	4.8	43.3	18	8.0	67.6	39	5.8	51.5
GROUND	107	24.3	67.6	44	19.6	87.0	151	22.7	74.2
AIR	128	29.0	96.6	28	12.4	99.6	156	23.4	97.6
NUCLEAR	10	2.3	98.9	1	0.4	100.0	11	1.6	99.2
<u>DWO</u>	<u>5</u>	<u>1.1</u>	<u>100.0</u>	<u>0</u>	<u>0.0</u>	<u>100.0</u>	<u>5</u>	<u>0.8</u>	<u>100.0</u>
TOTAL	441	100.0	100.0	225	100.0	100.0	666	100.0	100.0

Similar summary data are presented for each service in Tables 28 through 31. In Table 28 of Navy statistics, 58.8% of all drops and voluntary withdrawals occurred in Diving. Of nongraduating Navy students, 75.0% did not complete the Demolition course of instruction. For the Army, Air Force and Marine Corps respectively, 73.9%, 66.7% and 74.0% of all nongraduates did not complete the Ground Ordnance course of instruction. (See Tables 29, 30, 31).

Table 28
Drops and Voluntary Withdrawals Within EOD Curriculum

Navy Only

<u>COURSE</u>	<u>#</u> <u>DROPS</u>	<u>% NAVY</u> <u>DROPS</u>	<u>CUM %</u> <u>DROPS</u>	<u>#</u> <u>V/W</u>	<u>% NAVY</u> <u>V/W</u>	<u>CUM %</u> <u>V/W</u>	<u>#</u> <u>DROPS</u> <u>& V/W</u>	<u>% TOTAL</u> <u>ATTRITION</u>	<u>CUM. %</u> <u>ATTRITION</u>
DIVING	34	42.0	42.0	53	79.1	79.1	87	58.8	58.8
CORE	13	16.0	58.0	10	14.9	94.0	23	15.5	74.3
DEMO.	1	1.2	59.2	0	0.0	94.0	1	0.7	75.0
GROUND	16	19.8	79.0	3	4.5	98.5	19	12.8	87.8
AIR	10	12.3	91.3	1	1.5	100.0	11	7.4	95.2
NUCLEAR	2	2.5	93.8	0	0.0	100.0	2	1.4	96.6
<u>UWO</u>	<u>5</u>	<u>6.2</u>	<u>100.0</u>	<u>0</u>	<u>0.0</u>	<u>100.0</u>	<u>5</u>	<u>3.4</u>	<u>100.0</u>
TOTAL	81	100.0	100.0	67	100.0	100.0	148	100.0	100.0

Table 29

Drops and Voluntary Withdrawals Within the EOD Curriculum

Army Only

<u>COURSE</u>	<u>#</u> <u>DROPS</u>	<u>% ARMY</u> <u>DROPS</u>	<u>CUM. %</u> <u>DROPS</u>	<u>#</u> <u>V/W</u>	<u>% ARMY</u> <u>V/W</u>	<u>CUM. %</u> <u>V/W</u>	<u>#</u> <u>DROPS</u> <u>& V/W</u>	<u>% TOTAL</u> <u>ATTRITION</u>	<u>CUM. %</u> <u>ATTRITION</u>
CORE	36	28.3	28.3	47	41.3	41.3	83	34.5	34.5
DEMOLITION	14	11.0	39.3	15	13.1	54.4	29	12.0	46.5
GROUND	37	29.1	68.4	29	25.4	79.8	66	27.4	73.9
AIR	39	30.7	99.1	22	19.3	99.1	61	25.3	99.2
<u>NUCLEAR</u>	<u>1</u>	<u>0.8</u>	<u>99.9</u>	<u>1</u>	<u>0.9</u>	<u>100.0</u>	<u>2</u>	<u>0.8</u>	<u>100.0</u>
TOTAL	127	100.0	100.0	114	100.0	100.0	241	100.0	100.0

Table 30
Drops and Voluntary Withdrawals Within EOD Curriculum
Air Force Only

<u>COURSE</u>	<u>#</u> <u>DROPS</u>	<u>% ALL</u> <u>DROPS</u>	<u>CUM %</u> <u>DROPS</u>	<u>#</u> <u>V/W</u>	<u>% ALL</u> <u>V/W</u>	<u>CUM %</u> <u>V/W</u>	<u>#</u> <u>DROPS</u> <u>& V/W</u>	<u>% TOTAL</u> <u>ATTRITION</u>	<u>CUM. %</u> <u>ATTRITION</u>
CORE	83	37.2	37.2	23	54.8	54.8	106	40.0	40.0
DEMOLITION	5	2.2	39.4	2	4.8	59.6	7	2.6	42.6
GROUND	52	23.3	62.7	12	28.5	88.1	64	24.1	66.7
AIR	77	34.5	98.2	5	11.9	100.0	82	30.9	97.6
NUCLEAR	<u>6</u>	<u>2.7</u>	<u>99.9</u>	<u>0</u>	<u>0.0</u>	<u>100.0</u>	<u>6</u>	<u>2.3</u>	<u>99.9</u>
TOTAL	223	100.0	100.0	42	100.0	100.0	265	100.0	100.0

Table 31

Drops and Voluntary Withdrawals Within EOD Curriculum

Marine Corps Only

<u>COURSE</u>	<u>#</u> <u>DROPS</u>	<u>% ALL</u> <u>DROPS</u>	<u>CUM %</u> <u>DROPS</u>	<u>#</u> <u>V/W</u>	<u>% ALL</u> <u>V/W</u>	<u>CUM %</u> <u>V/W</u>	<u>#</u> <u>DROPS</u> <u>& V/W</u>	<u>% TOTAL</u> <u>ATTRITION</u>	<u>CUM. %</u> <u>ATTRITION</u>
CORE	4	40.0	40.0	1	50.0	50.0	5	41.6	41.6
DEMOLITION	1	10.0	50.0	1	50.0	100.0	2	16.7	57.3
GROUND	2	20.0	70.0	0	0.0	100.0	2	16.7	74.0
AIR	2	20.0	90.0	0	0.0	100.0	2	16.7	90.7
<u>NUCLEAR</u>	<u>1</u>	<u>10.0</u>	<u>100.0</u>	<u>0</u>	<u>0.0</u>	<u>100.0</u>	<u>1</u>	<u>8.3</u>	<u>100.0</u>
TOTAL	10	100.0	100.0	2	100.0	100.0	12	100.0	100.0

Attrition and Rollbacks, Phases II and III, Indian Head

The previous sections presented results indicating that the majority of drops in all services were due to academic reasons. In this section, data on rollbacks are presented and the occurrence of rollbacks among graduates and nongraduates is discussed.

Distribution of Rollback Type by Service

Rates of rollbacks for each service appear in Table 32. Of all inputs, 61.6% were not rolled back. The Navy had the highest percentage of students with no rollbacks, 71.8%, while the Air Force had the lowest, 58.4%.

Table 32

Occurrence of Rollbacks by Service

	<u>Rollbacks</u>										
	<u>NONE</u>		<u>ACDM.</u>		<u>ADMIN.</u>		<u>MEDICAL</u>		<u>COMB.</u>		
<u>SERVICE</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>TOTAL</u>
NAVY	278	71.8	67	17.3	16	4.1	15	3.9	11	2.8	387
ARMY	472	59.4	244	30.7	53	6.7	9	1.1	17	2.1	795
AIR FORCE	433	58.4	189	25.5	75	10.1	20	2.7	24	3.2	741
<u>MARINE CORPS</u>	<u>57</u>	<u>63.3</u>	<u>23</u>	<u>25.6</u>	<u>4</u>	<u>4.4</u>	<u>1</u>	<u>1.1</u>	<u>5</u>	<u>5.6</u>	<u>90</u>
TOTAL	1240	61.6	523	26.0	148	7.4	45	2.2	57	2.8	2013

Reasons given for rollbacks are presented in Table 33. Academic reasons account for 67.7% of all rollbacks, administrative reasons are given for 19.1% and medical reasons account for 5.8%. The 7.4% remaining students were rolled back for a combination of reasons. For example, a student who rolled back in the Core course for medical reasons and rolled back in the Air Ordnance course for administrative reasons was placed in this combination category. The majority of rollbacks in each service were due to academic reasons. The Navy had the highest rate of medical rollbacks and the Air Force had the most administrative rollbacks.

Table 33
Types of Rollbacks

<u>SERVICE</u>	<u>ACADEMIC</u>		<u>ADMIN.</u>		<u>MEDICAL</u>		<u>COMB.</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
NAVY	67	61.5	16	14.7	15	13.8	11	10.1	109
ARMY	244	75.4	53	16.4	9	2.8	17	5.3	323
AIR FORCE	189	61.4	75	24.4	20	6.5	24	7.7	308
<u>MARINE CORPS</u>	<u>23</u>	<u>69.7</u>	<u>4</u>	<u>12.2</u>	<u>1</u>	<u>3.0</u>	<u>5</u>	<u>15.2</u>	<u>33</u>
TOTAL	523	67.7	148	19.1	45	5.8	57	7.4	773

Rollbacks and Ultimate Status

Table 32 indicates that 71.8% of all Navy inputs had no rollbacks. However, 75.0% of all Navy attrition at Indian Head occurred prior to the completion of the Demolition course of instruction. The low percentage of students in the Navy who were rolled back may be due to the high rates of attrition early in the curriculum.

Two questions are raised. First, did students who are rolled back have a higher rate of attrition than students who are not rolled back? Second, did students who voluntarily withdrew have a different pattern of rollbacks than students who were dropped? Statistics presented in Table 32 indicate that 38.4% of all inputs were rolled back. The ultimate status of these rollbacks are shown in Table 34. Of inputs who rolled back, 63.5% graduated, 27.2% were dropped and 9.3% voluntarily withdrew.

Table 34

Ultimate Status of Rollbacks by Type of Rollback

Ultimate Status

<u>TYPE OF ROLLBACK</u>	<u>GRADUATES</u>		<u>DROPS</u>		<u>V/W</u>		<u>TOTAL</u>
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	
ACADEMIC	312	59.7	158	30.2	53	10.1	523
ADMINISTRATIVE	109	73.6	29	19.6	10	6.8	148
MEDICAL	32	71.1	8	17.8	5	11.1	45
<u>COMBINATION</u>	<u>38</u>	<u>66.7</u>	<u>15</u>	<u>26.3</u>	<u>4</u>	<u>7.0</u>	<u>57</u>
TOTAL	491	63.5	210	27.2	72	9.3	773

Rollback rates for graduates, drops and voluntary withdrawals appear in Table 35. Students who dropped were rolled back the most while students who voluntarily withdrew were rolled back the least. Academic reasons account for the majority of rollbacks for graduates and nongraduates. Graduates had the highest rate of administrative rollbacks. Students who were dropped differed significantly in rollback rates from graduates ($\chi^2 = 28.91$, $p < .01$) and voluntary withdrawals ($\chi^2 = 16.04$, $p < .01$). No differences were found between graduates and voluntary withdrawals in terms of patterns of rollbacks. This indicates that factors other than academic, administrative or medical difficulties in the curriculum may influence those who voluntary withdrawal.

Table 35

Types of Rollbacks by Ultimate Status, All Services

Graduates: 63.5% had no rollbacks. Of those who were rolled back:

63.5% were for academic reasons
22.2% were for administrative reasons
6.5% were for medical reasons
7.7% were for more than one reason

Drops: 52.4% had no rollbacks. Of those who were rolled back:

75.2% were for academic reasons
13.8% were for administrative reasons
3.8% were for medical reasons
7.1% were for more than one reason

V/W's: 68.0% had no rollbacks. Of those who were rolled back:

73.6% were for academic reasons
13.9% were for administrative reasons
6.9% were for medical reasons
5.6% were for more than one reason

The percentages of graduates, drops, and voluntary withdrawals for each type of rollback are given in Table 36. Of students who were rolled back for academic reasons, 59.7% graduated, 30.2% dropped and 10.1% voluntarily withdrew. In the case of administrative rollbacks, 73.6% graduated, 19.6% dropped and 6.8% voluntarily withdrew. Of students who were rolled back for medical reasons, 71.1% graduated, 17.8% dropped and 11.1% voluntarily withdrew.

Table 36

Distribution of Graduates and Nongraduates for Each Category of Rollbacks

Of students who rolled back for academic reasons:

59.7%	- Graduated
30.2%	- Dropped
<u>10.1%</u>	- V/W
100.0%	

Of students who rolled back for administrative reasons:

73.6%	- Graduated
19.6%	- Dropped
<u>6.8%</u>	- V/W
100.0%	

Of students who rolled back for medical reasons:

71.1%	- Graduated
17.8%	- Dropped
<u>11.1%</u>	- V/W
100.0%	

Of students who rolled back for more than one reason:

66.7%	- Graduated
26.3%	- Dropped
<u>7.0%</u>	- V/W
100.0%	

Summary of EOD School Attrition Phases II & III, Indian Head

Data presented so far can be summarized as follows:

Navy Personnel Enrolled in EOD Training

- 1) The Navy has the highest rate of attrition, with only 61.8% of inputs graduating.
- 2) Of the nongraduates, approximately half were dropped and half voluntarily withdrew.
- 3) Attrition among the personnel of the lower paygrades, E1, E2, E3 was twice as high as that of paygrades E4 and above.
- 4) Poor academic performance was the source of 66.7% of Navy drops while 19.7% were due to medical reasons, the highest rate of medical drops.
- 5) Of drops due to medical reasons, 50.0% occurred in Diving.
- 6) Of all attrition in the Navy, 42.0% of drops and 79.2% of voluntary withdrawals occurred during Diving instruction. This represents 58.8% of all Navy attrition at Indian Head.

Army Personnel Enrolled in EOD Training

- 1) 69.7% of all Army inputs graduate.
- 2) Approximately equal percentages of inputs dropped and voluntarily withdrew.
- 3) The low paygrades had significantly lower graduation rates than the higher paygrades.
- 4) 89.7% of all Army drops occurred for academic reasons. Of the remaining drops, administrative reasons were twice as frequent as medical reasons.
- 5) Army drops occurred at approximately equal rates in the Core, Ground and Air courses. 88.1% of all Army drops occurred in these courses.
- 6) 42.1% of Army voluntary withdrawals occurred in Core instruction.

Air Force Personnel Enrolled in EOD Training

- 1) The Air Force had the second highest rate of attrition with 35.8% of inputs not graduating.
- 2) The Air Force had the highest percentage of drops--30.1%--and also the greatest difference between drop and voluntary withdrawal rates of all the services. There were over five times as many drops as voluntary withdrawals.
- 3) 44.9% of Air Forces E1's graduated while 66.1% or more of all other paygrades graduated.
- 4) 76.2% of Air Force drops are due to academic reasons. The remaining drops occurred equally for medical and administrative reasons.
- 5) Within the Air Force, voluntary withdrawals occurred at the highest rate, 54.8%, in Core instruction followed by the Ground Ordnance course at 28.5%.

Marine Corps Personnel Enrolled in EOD Training

The Marine Corps had the lowest rate of attrition. The small size of attrition groups prohibits the identification of more specific patterns of attrition in this service.

Attrition, Phase I, Redstone Arsenal

The previous sections of this report examined EOD attrition occurring in Phases II and III at Indian Head, Maryland. This section presents attrition statistics for Phase I of EOD training conducted at Redstone Arsenal, Huntsville, Alabama. This information is then examined in conjunction with attrition data from Indian Head to provide a complete description of attrition occurring during the overall EOD training program.

Attrition, Phase I, Redstone Arsenal, All Services

Data from Phase I at Redstone Arsenal are for fiscal year 1981 only. These data appear in Table 37 and sources of attrition are classified as Physical Training, Academic, Nonacademic, or Other. Regardless of service, 80.6% of all students beginning at Redstone Arsenal successfully completed that portion of EOD training and proceeded to Phase II at Indian Head. Academic attrition reduced the number of inputs by 10.6%. Nonacademic attrition and physical training reduced the number of inputs by about 4% each, for a total attrition rate of 19.4%.

The percentage of total attrition by source is also examined. Academic reasons account for 54.9% of all attrition at Redstone Arsenal. Physical training and nonacademic reasons were cited as sources of attrition at approximately equal rates.

Table 37

Attrition at Redstone Arsenal, All Services

Fiscal Year 1981

<u>CATEGORY</u>	<u>NUMBER</u>	<u>% INPUTS</u>	<u>% ATTRITION</u>
SUCCESSFUL INPUTS	554	80.6	0.0
ACDM. ATTR.	73	10.6	54.9
NONACDM. ATTR.	29	4.2	21.8
PHY. TRNG. ATTR.	28	4.1	21.1
<u>OTHER*</u>	<u>3</u>	<u>0.4</u>	<u>2.2</u>
TOTAL	687	100.0	100.0

*No reason given

Attrition, Phase I, Redstone Arsenal, Navy Personnel Only

Sources of attrition for Navy personnel only are presented in Table 38. Of Navy inputs at Redstone Arsenal, 75.7% graduate and 24.3% do not complete training. Approximately 16.0% drop or voluntarily withdraw during the physical training phase prior to the chemical/biological course of instruction. This accounted for 65.1% of Navy attrition at Redstone Arsenal. Academic reasons accounted for 20.9% of the attrition. The remaining 14.0% of Navy attrition at Redstone Arsenal occurred for nonacademic reasons.

Table 38

Attrition at Redstone Arsenal, Navy Personnel Only

Fiscal Year 1981

<u>CATEGORY</u>	<u>NUMBER</u>	<u>% INPUTS</u>	<u>% ATTRITION</u>
SUCCESSFUL INPUTS	134	75.7	0.0
PHY. TRNG. ATTR.	28	15.8	65.1
ACADEMIC ATTRITION	9	5.1	20.9
<u>NONACADEMIC ATTR.</u>	<u>6</u>	<u>3.4</u>	<u>14.0</u>
TOTAL	177	100.0	100.0

Attrition, Phase I, Redstone Arsenal, Non-Navy Personnel

Only students in the Navy participated in the physical training program at Redstone Arsenal. Excluding Navy students from the analysis, the attrition rates are seen in Table 39. Of non-Navy inputs at Redstone Arsenal, 82.4% completed that portion of training and continued at Indian Head. Poor academic performance accounted for 71.1% of the attrition while nonacademic reasons comprised 25.6% of non-Navy attrition at Redstone Arsenal.

Table 39

Attrition at Redstone Arsenal,
Army, Air Force, and Marine Corps
Fiscal Year 1981

<u>CATEGORY</u>	<u>NUMBER</u>	<u>% INPUTS</u>	<u>% ATTRITION</u>
SUCCESSFUL INPUTS	420	82.4	0.0
ACADEMIC ATTRITION	64	12.5	71.1
NONACADEMIC ATTR	23	4.5	25.6
<u>OTHER ATTR.*</u>	<u>3</u>	<u>0.6</u>	<u>3.3</u>
TOTAL	510	100.0	100.0

*No reason given

EOD School Attrition, Phases I, II, & III, Redstone Arsenal & Indian Head

In previous sections, data for attrition at Redstone Arsenal and Indian Head were examined separately. In this section these data are combined to provide a complete description of attrition in the entire EOD School program.

The overall rate of attrition in Phase I at Redstone Arsenal was 19.4%. Therefore, the number of students entering training at Indian Head was approximately one-fifth less than the original number of inputs. Of the students who successfully completed Phase I and continue to Phase II at Indian Head, one-third did not graduate. Based on the attrition rates calculated in the six years covered by this report, total attrition rates expected for both Redstone Arsenal and Indian Head appear in Tables 40 to 42. Compiling these expectancies across all EOD training phases yielded an estimate of total attrition.

Overall Attrition, All Services

Table 40 shows the estimated attrition assuming a total of 500 inputs from all services in one year.

Table 40

Estimated Annual Attrition, Phases I, II and III, All Services

Assume a total of 500 students enter Redstone Arsenal in a year. Attrition is estimated as follows:

<u>REDSTONE ARSENAL</u>	<u># INPUTS</u>	<u># DROPS & V/W</u>	<u>% ALL INPUTS</u>	<u>% ATTRITION</u>	<u>CUM. % ATTRITION</u>
PHYSICAL TRAINING	500	21	4.2	9.1	9.1
CHEMICAL/BIO. COURSE:					
ACADEMIC }	479	53	10.6	23.0	32.1
NONACADEMIC }		23	4.6	10.0	42.1
<u>INDIAN HEAD</u>					
DIVING	403	17	3.4	7.4	49.5
CORE	386	44	8.8	19.1	68.6
DEMO.	342	8	1.6	3.5	72.1
GROUND	334	30	6.0	13.0	85.1
AIR	304	31	6.2	13.5	98.6
NUCLEAR	273	2	1.0	0.9	99.5
<u>UWO</u>	<u>271</u>	<u>1</u>	<u>0.5</u>	<u>0.4</u>	<u>99.9</u>
TOTAL	270	230	46.0	100.0	100.0

The total estimated attrition is 46.0%. That is, only 54.0% of all inputs successfully completed training. Of this attrition, 42.2% occurred at Redstone Arsenal and 57.8% occurred at Indian Head. Academic failures at Redstone Arsenal were the highest single source of attrition, totaling 23.0%, followed by 19.1% in Core instruction. The Air Ordnance and Ground Ordnance courses accounted for 13.5% and 13.0% of all attrition, respectively.

Overall Attrition, Navy Personnel

Attrition for Navy personnel only is estimated as shown in Table 41. Only 48.0% of Navy inputs graduated. Of Navy attrition, 46.2% occurred at Redstone Arsenal and 53.8% occurred at Indian Head.

The physical training program was the source of 66.7% of the attrition at Redstone Arsenal and 30.8% of all Navy attrition. Diving instruction accounted for 60.7% of the attrition at Indian Head and 32.7% of all Navy attrition. Physical training and diving instruction combined accounted for 63.5% of all Navy attrition. Approximately 80.0% of all Navy drops and voluntary withdrawals occurred before the completion of diving instruction.

Overall Attrition, Non-Navy Personnel

Only Navy students participate in the physical training program at Redstone Arsenal and in the Diving and Underwater Ordnance instruction at Indian Head. Attrition of non-Navy personnel is presented separately in Table 42. These figures exclude attrition unique to the Navy. Total attrition was 44.0% with 38.6% of this total occurring at Redstone Arsenal and 61.4% occurring at Indian Head.

Poor academic performance at Redstone Arsenal accounted for 28.4% of all attrition. This is followed by Core instruction at 22.7% and Air Ordnance instruction at 17.0%. The next highest source of instructional program attrition was the Ground Ordnance course at 14.8%.

Table 41

Estimated Annual Attrition, Phases I, II and III, Navy Personnel Only

Assume 200 Navy students enter Redstone Arsenal in a year. Attrition is estimated as follows:

<u>REDSTONE ARSENAL</u>	<u># INPUTS</u>	<u># DROPS & V/W</u>	<u>% ALL INPUTS</u>	<u>% ATTRITION</u>	<u>CUM. % ATTRITION</u>
PHYSICAL TRAINING	200	32	16.0	30.8	30.8
CHEMICAL/BIO. COURSE:					
ACADEMIC }	168	9	4.5	8.9	39.5
NONACADEMIC }		7	3.5	6.7	46.2
<u>INDIAN HEAD</u>					
DIVING	152	34	17.0	32.7	78.9
CORE	118	9	4.5	8.6	87.5
DEMOLITION	109	0	0.0	0.0	87.5
GROUND	109	7	3.5	6.7	94.2
AIR	102	4	2.0	3.8	98.0
NUCLEAR	98	0	0.0	0.0	98.0
<u>UWO</u>	<u>98</u>	<u>2</u>	<u>1.0</u>	<u>2.0</u>	<u>100.0</u>
TOTAL	96	104	52.0	100.0	100.0

Table 42

Estimated Annual Attrition, Phases I, II and III, Non-Navy Personnel

Assume 200 non-Navy students enter Redstone Arsenal in a year. Attrition is estimated as follows:

<u>REDSTONE ARSENAL</u>	<u># INPUTS</u>	<u># DROPS & V/W</u>	<u>% ALL INPUTS</u>	<u>% ATTRITION</u>	<u>CUM. % ATTRITION</u>
CHEM/BIO. COURSE:					
ACADEMIC ATTRITION	200	25	12.5	28.4	28.4
NONACADEMIC ATTR.		10	5.0	11.4	39.8
<u>INDIAN HEAD</u>					
CORE	165	20	10.0	22.7	62.5
DEMO.	145	4	2.0	4.5	67.0
GROUND	141	13	6.5	14.8	81.8
AIR	128	15	7.5	17.0	98.8
<u>NUCLEAR</u>	<u>113</u>	<u>1</u>	<u>0.5</u>	<u>1.1</u>	<u>99.9</u>
TOTAL	112	88	44.0	100.0	100.0

Summary of EOD School AttritionAttrition, Phases II and III, Indian Head

Attrition at the U.S. Naval School of Explosive Ordnance Disposal increased linearly from 1976 to 1981. The graduation rate declined from 83.9% in 1976 to 57.1% in 1981. A linear increase in attrition occurred in each service. Attrition among Navy personnel increased the greatest, with a decline in graduation rate from 87.0% to 36.5% during this six year period.

Nongraduates in the Army and Navy were dropped and withdrew voluntarily at approximately equal rates. The frequency of drops among Air Force and Marine Corps personnel exceeded five times that of voluntary withdrawals.

Over 50.0% of all attrition at Indian Head occurred in the first three courses of instruction. Of nongraduates, 75.0% did not complete the third course of instruction and 97.6% did not reach Phase III. Diving instruction was the source of 58.8% of Navy attrition at Indian Head. Attrition of non-Navy personnel occurred primarily in the Core, Ground and Air Ordnance courses of instruction.

The number of inputs from lower paygrades enrolled at EOD school increased during the study period. Attrition rates for lower paygrade personnel were significantly higher than for personnel in paygrades E4 and above, and these rates increased over time. Attrition of personnel in paygrades E4 and above also increased from 1976 to 1981, suggesting that factors in addition to the increased number of inputs from lower paygrades contributed to the overall increase in attrition.

Inputs at Indian Head rolled back at least once at a rate of 39.4%. Of those students who rolled back, 67.7% did so due to academic difficulties. Students who were dropped rolled back at significantly higher rates than graduates or those students who withdrew voluntarily. No differences were found in rollback patterns between students who graduated and those who voluntarily withdrew. This suggests that students who voluntarily withdraw do so for reasons other than or in addition to academic, administrative or medical difficulties encountered in the EOD School curriculum.

Attrition, Phase I, Redstone Arsenal

At Redstone Arsenal, 80.6% of all inputs successfully completed Phase I of EOD training. Academic difficulties were the source of 54.9% of all attrition at Redstone Arsenal. Attrition due to nonacademic reasons occurred at approximately the same rate as attrition due to the physical training program.

The attrition rate for Navy personnel during Phase I of FY81 was 24.3%. Physical training was the source of 65.1% of this attrition, while academic difficulties accounted for 20.9% of Phase I Navy attrition. Academic difficulties were the source of 71.1% of attrition of non-Navy personnel at Redstone Arsenal. The rate of input completion of Phase I for non-Navy personnel was 82.4%

Estimated Attrition, Phases I, II and III, Redstone Arsenal and Indian Head

Since comparable data bases for Phase I and Phases II and III did not exist, attrition expectancies were derived. These expectancies were based on attrition statistics from Phase I (Fiscal Year 1981) and Phases II and III for calendar years 1976 through 1981.

The total attrition rate for the overall EOD School program was 46.0%. Of this attrition, 42.2% occurred at Redstone Arsenal and 57.8% occurred at Indian Head. Academic difficulties in Phase I at Redstone Arsenal were the highest single source of attrition at 23.0%, followed by Core instruction at 19.1%.

The total graduation rate for Navy inputs was 48.0%. Of Navy attrition, 46.2% occurred during Phase I at Redstone Arsenal and 53.8% at Indian Head. The physical training program was the source of 66.7% of the attrition at Redstone Arsenal and 30.8% of all Navy attrition. Diving instruction accounted for 60.7% of the attrition at Indian Head and 32.7% of all Navy attrition. Physical training and diving instruction were the sources of 63.5% of all Navy attrition. Approximately 80.0% of all Navy attrition occurred prior to the completion of Diving instruction.

The attrition rate for non-Navy personnel was 44.0%. Poor academic performance during Phase I was the source of 28.4% of this attrition. The next highest source of non-Navy attrition was the Core course of instruction at 22.7%, followed by the Air Ordnance course at 17.0%.

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