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Correlating Training Effort and Tactical Proficiency

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Summary

The Navy budget allocates resources to prepare units for warfighting missions. Type Commands estimate how much training Navy units need in each warfare area. These estimates are based on expert judgment of the amount of training required to become warfare qualified, maintain currency, or regain currency following time out of unit. Three mechanisms support warfare training: modeling and simulation, fleet schools, and flight and steaming hours.

OPNAV uses these estimates to allocate resources to meet as much of the fleet need as possible, within the bounds of fiscal constraints. This results in an allocation plan. Naval units use the allocated resources to develop warfighting proficiency. Readiness measures (for example, SORTS) reflect the training effort expended, and the readiness measures can be connected to resources. N813 seeks a training event-proficiency connection as one part of the Integrated Warfare Architecture (IWAR) process.

Approach

The purpose of this study is to attempt to correlate existing individual exercise training data that reflect warfighting proficiency to training effort expended. Our tasking was to use existing fleet data sources. Previous CNA studies [1] have connected proficiency to training resources, but this effort required unique and extensive data collection and did not always reflect existing data sources. Our goal was to identify a similar connection based on existing fleet data sources.

We analyzed unit training for three types of platforms for three mission areas:

- Multi-crew support aircraft (P-3Cs) and their anti-submarine warfare (ASW) mission

- Surface combatants and their naval surface fire support (NSFS) mission
- Tactical aircraft (F/A-18s) and their strike warfare (STW) mission.

Analysis and implications

There are two means of attempting to establish a connection between training resources and warfighting proficiency. The first is to use existing fleet data sources as we did for this study. The second is to identify a unit and set up a data collection plan to capture quantifiable measures of performance, and then follow the unit through the training cycle. The latter is more of a test case to determine wether it is possible to draw the link. Our tasking was to use existing fleet data sources.

The existing fleet data sources we found for each platform and warfare area are centered around qualification events. These training events are governed by T&R matrices and supporting training manuals. T&R matrices provide guidance on the required resources qualifications events and standards for evaluation. Training resource expenditures are tracked and maintained in various databases; however, performance measure data are not. We found this to be the case with each platform and warfare area.

Our analysis shows that using qualification data is problematic because such data say only that the unit met the minimum standard required to pass the qualification. While existing fleet data structures adequately capture that information, they do not capture related detailed information on the number of attempts it took to achieve the qualification—which is an objective, quantifiable measure of performance that translates into proficiency to execute the mission. As a result we were unable to establish a connection between training resources and warfighting proficiency, using existing fleet data.

That said, existing data may be adequate to link or correlate training resources to readiness levels. One could use the existing fleet data, to predict the number of resources required to obtain and/or maintain a particular readiness level. But as our analysis has shown, and as we demonstrate through out this document, readiness is not synonymous with proficiency.

To determine whether a correlation can be established between training resources and warfighting proficiency, we found that data other than those currently collected will need to be used. In general, these data will need to reflect quantifiable measures of performance over time. As an example such data include individual bomb scoring data for aircrews as they train through the inter-deployment training cycle (IDTC).

Introduction

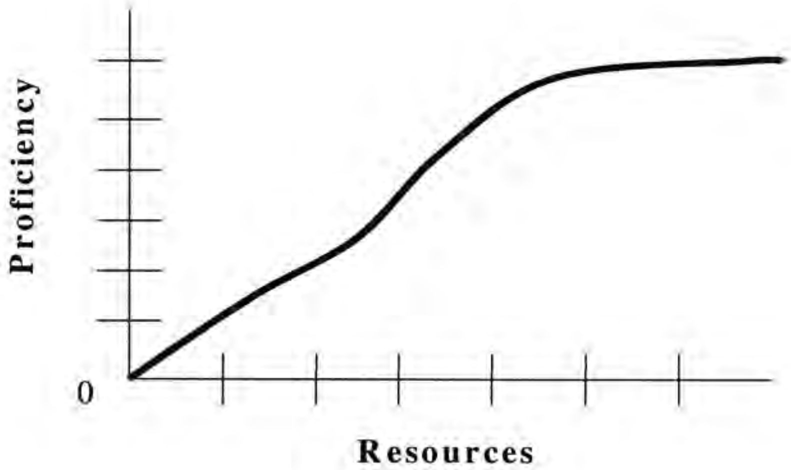
The Navy budget allocates resources to train units for warfighting missions. The amount allocated is determined by two factors: the Navy's fiscal constraints, and the Type Commands' estimates of how much training units need in each warfare area. Currently, the Navy measures a unit's readiness to perform warfighting missions using pre-determined definitions. Readiness measures (for example, SORTS) reflect the training effort expended, which can be connected to resources. Readiness, however, is not the same as proficiency.

N813 seeks a connection between training events and proficiency, as one part of the Integrated Warfare Architecture (IWAR) process. Finding such a connection would yield many benefits to decision-makers in allocating resources, and to the training community in structuring curricula and determining resource requirements.

Figure 1 illustrates a notional connection that would aid decision-makers in budgeting resource allocations. Clearly, in this notional learning-curve, there is a correlation between resources and proficiency. A decision-maker could use such a correlation to budget the training resources to achieve the desired level of proficiency.

Often we see the word "readiness" replacing the word "proficiency." The readiness data is based on training qualification events from the Training and Readiness (T&R) matrices. The evaluation of these events are typically based on the completion of the event vice an objective quantifiable measure of how well a crew performed. Some of the data we found contains numeric scores of a crew's performance, however, the measurement definitions are subjective descriptions. These readiness measurements do not equate to proficiency measurements.

Figure 1. Ideal relationship between resources and proficiency



To properly measure proficiency and identify a learning-curve the data source must contain a quantifiable measure that can allow for making predictions of future performance. The most common example of such a measurement is the circular error probably (CEP) for bomb scoring or naval gunfire.

Approach

In this study, we attempted to correlate existing individual exercise training data that reflects warfighting proficiency to training effort expended. We analyzed unit training for three types of platforms for three different mission areas:

- Multi-crew support aircraft (P-3Cs) and their anti-submarine warfare (ASW) mission
- Surface combatants and their naval surface fire support (NSFS) mission
- Tactical aircraft (F/A-18s) and their strike warfare (STW) mission.

Many factors contribute to performance. Because of the short timeline for this study and the IWAR process, our data collection effort was limited to existing fleet data sources. We used each platform's Training and Readiness (T&R) matrix and supporting training manuals as the basis for our search for existing fleet data. By using existing fleet data we limited the number of variables or factors we used to identify the relationship between training expenditures and warfighting proficiency.

Data collection

Resource data

We rely on each platform's T&R for identifying resource variables. For the different warfighting platforms, we used different resource variables. For the surface combatants executing NSFS we relied on the number of rounds expended and number of training opportunities available. For the F/A-18s and P-3Cs we used event or flight hours expended for Strike Warfare and Anti-Submarine Warfare, respectively. (Squadrons are funded by event hours.)

We provide more detail on the resource data we used, in each specific warfighting platform section. In general, we identified the resource variable based on unit training histories (i.e., the type of training conducted or required prior to deployment and based on existing fleet data sources.)

Performance, resources, and proficiency

Throughout this paper we use the terms "performance," "readiness," and "proficiency." Each of these terms has a distinct meaning, which we will define here. We draw the distinction between performance and proficiency based on the existing fleet data sources we found. This is because existing data reflect performance measures for different missions, not proficiency in executing those missions.

The existing data sources are generated from the readiness qualification requirements. When we say "performance," we are describing a measurable assessment of a unit's execution of a mission or training event. Readiness measurements reflect pre-defined ratings, which are stated as goals for units to achieve by a specific time. One way units achieve their readiness ratings is through training exercises or qualification events.

We do not use the terms "proficiency" and "readiness" interchangeably. Checking the box on a T&R matrix qualification demonstrates that a crew has successfully performed a training event or mission. "Success" is defined as satisfying a set of evaluation standards.

Such readiness qualifications, however, do not show a crew's proficiency, because they do not often take into account the failed attempts to qualify. That is, a crew is required merely to get the qualification. The number of times it failed to qualify is not a determining factor; only the final success is recorded in the readiness evaluation. For example, if it takes one crew three attempts to employ a weapon system and another only one, each receives the qualification—but the two crews are not necessarily equally proficient.

Outline

This paper is divided into three sections: MARPAT aircraft, surface combatants, and strike-fighter aircraft. In each section we describe the unit-level training histories, i.e., training conducted during the work-up cycle. We next describe the existing fleet data sources for resource and performance measures we identified. We then summarize our analysis based on the data and its implications. Where appropriate we make comments on strength of the existing data as well as the lack of sufficient data sources. These factors affect our ability to determine the relationship between resource expenditures and warfighting proficiency.

Maritime patrol aircraft

In this section we analyzed the P-3C maritime patrol aircraft (MARPAT) and its ASW mission.We attempted to identify a relationship between a defined resource and a performance measure. We first provide some background information on the P-3C IDTC and its T&R matrix highlighting the ASW training events. Second, we describe the resource and performance variables we analyzed. Finally, we summarize our analysis.

P-3C Anti-Submarine Warfare training

We concentrated our efforts on the Patrol and Reconnaissance Force, Atlantic. Our data source is a database used to track resources and qualifications events. Our data collection and analysis focused on the crew level, i.e., we viewed a single P-3C crew as a unit. As we will show later, this is different from the F/A-18 TACAIR portion, where we viewed the squadron as a single unit.

We used flight hours over a period of time as our resource variable. Our performance measure is based on qualification data. Qualification data are defined as training evolutions designed to support one of the primary mission areas (PMAs) in the T&R matrix. In the case of the P-3C, ASW is the PMA.

P-3C crew training

The MARPAT community operates on an 18-month IDTC. The first 12 months are dedicated to training and squadrons deploy the last 6 months. Each squadron consists of 12 crews. Each crew consists of 11 crew-members. Table 1 lists the members of a P-3C crew [3].

Table 1. P-3C crew members[a]

Patrol Plane Commander (PPC)*	Sensor Station 2 (SS2) (acoustic operator)
Second Pilot (PPP) (designated co-pilot)	Sensor Station 3 (SS3) (non-acoustic operator)*
Third Pilot (PPCP)	Flight engineer
Tactical Coordinator (PPTC)*	Flight engineer
Navigator/Communicator (PPNC)	Flight technician
Sensor Station 1 (SS1)* (acoustic operator)	

a. * denotes the tactical nucleus (TACNUC) crew member.

Two types of training are conducted during the IDTC: positional qualification training and tactical training. Positional qualification training refers to crew members training to move up within the hierarchical crew structure—for example, a pilot training to move from PPP to PPC and an NFO training to become a PPTC [3].

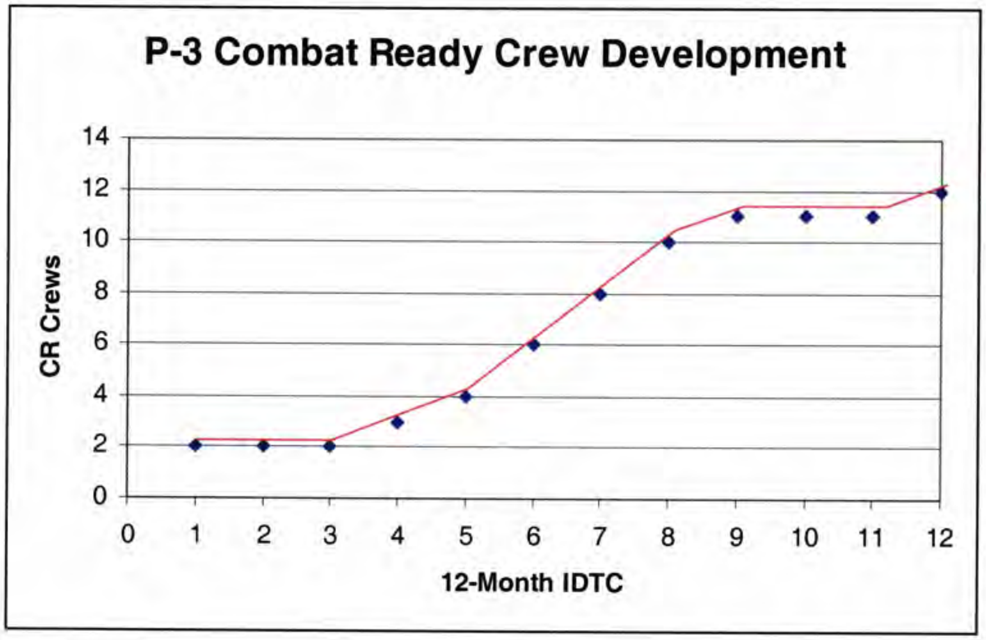
The first step in building crew proficiency (building a Combat-Ready crew) is participation in the Tactical Proficiency Course (TPC). This course corresponds to the T&R matrix event Mobility 8. As new crews are formed (after returning from deployment) and the TACNUC crew members (and the designated upgraders) are established to form the TACNUC, the crew participates in TPC [3].

TPC consists of 6 days of classroom training combined with several simulation events. The simulation events are the same as the T&R ASW events they trained to: ASW-1, ASW-2, ASW-3, and the Anti-Surface mission ASU-1. TPC provides an opportunity for the crew to begin building the necessary coordination skills required for executing the actual events and for deployment. Once the crew successfully completes TPC, it can begin the qualification events for the different T&R primary mission areas (PMAs).

Training and Readiness matrix

The T&R is predicated on producing Combat-Ready (CR) crews. A PMA CR crew is considered ready for deployment for that PMA. The training and readiness manual outlines a readiness curve for crews based on the CR requirement over the 12-month IDTC. Figure 2 is the notional CR crew development outlined in [3].

Figure 2. Notional CR crew development



There are six ASW qualification events outlined in the T&R matrix [4]:[1]

- ASW-1— Anti-submarine warfare diesel and/or littoral water
- ASW-2— Anti-submarine warfare nuclear and/or open ocean
- ASW-3— Anti-submarine warfare joint coordination exercise
- ASW-4— Anti-submarine warfare attack exercise
- ASW-5— Anti-submarine warfare attack extended echo ranging
- ASW-6— Anti-submarine warfare beartrap.

1. See appendix A for a copy of the P-3C T&R matrix.

Crews are allowed to qualify for two events during a single sortie. This is often accomplished by combining ASW3 with another qualification event. Once a crew has completed the TPC, the focus of its training shifts to the PMAs. Crews obtain and maintain ASW CR status by executing ASW events 1 through 4 periodically.

Resource data

The East Coast MARPAT wings, unlike the West Coast wing, do not use the SHARP database to maintain readiness and qualification data. However, a database is maintained to track resource information. The source for the database is the Wing Activity Analysis Report.

We rely on flight hours for our resource data. In addition, because we used qualification data, we analyze the number of hours required for a crew to achieve and maintain the pre-defined proficiency level of CR status. Flight hour data is divided into two categories:

- On-station hours
- Total hours.

On-station hours are those hours in which the tactical training takes place. They do not include the transit time to or from the range or training area. The transit hours are added to on-station hours and are represented in total hours.

These data are collected for the different training opportunities:

- In-flight upgrade training
- Dedicated training
- Fleet exercise training.

In-flight upgrade training focuses on individual crew members (positional qualification training) developing skills to progress up within the crew structure. For example, a pilot moves up from a PPCP designation to PPP and finally to PPC. The Training and Readiness matrix Mobility events are designed for upgrade training.

Dedicated and fleet exercise training events constitute tactical training. The dedicated training events are primary mission areas in the T&R matrix, the most dominant being ASW and anti-surface warfare (ASU). "Fleet exercise training" refers to exercise events such as COMPTUEX or JTFEX, in which MARPAT participate.

For fleet exercise training, crews can request an evaluation after the sortie. With dedicated training the crew must make the request for the evaluation prior to the sortie. The details of the evaluations are provided in the performance data section below.

We examined the number of on-station hours for dedicated training and fleet exercise training, and used this as our resource variable in an attempt to identify a link between resources and performance.

Performance data

The qualification events that provide the resource information also supply the performance information. We compare the flight hours, level of training effort, with the performance measures. For our purposes, the performance measure is defined as achieving combat ready status. In T&R terms, that translates to a crew obtaining a minimum of 70 PMA points in a particular warfare area. We did not examine PMA readiness points in this analysis. We did examine the on-station effectiveness (OSE) grades at three points in time. See appendix A for a sample of the OSE scoring sheets.

During dedicated training events crews are evaluated first on an individual basis and then as a single unit. The individual crew members graded are:

- Mission commander
- Navigator/Communicator
- Sensor station 1 and 2
- Sensor station 3.

The OSE evaluation is a numeric grade. The grading covers all of the mission phases and the applicable skills and procedures. The summary OSE grade is a weighted average of the individual scores. Again, these crew members receive a numeric ranking of their performance during a qualification event. Crew members must receive a minimum score of 85 percent to receive the qualification. The debriefing officer conducts the evaluation [2].

The overall grade for the crew in executing a mission is a "pass" or "fail." Each mission phase is evaluated by a broadly defined criteria:

- "Q" for qualified in that phase
- "CQ" for conditionally qualified
- "U" for not qualifying.

However, there is no numeric value to this grade, however, there is a structured process for the evaluations. Each of the qualification events are reconstructed and reviewed by a debriefing officer and a Wing certifying officer [3]. See appendix A for an example of the overall grading sheet for a qualifying event.

We analyzed the P-3C ASW data in two ways. First, we attempted to identify a link between the on-station hours (dedicated training and fleet training exercises) and achieving CR status. Second, we examined the OSE grades and the number of qualification events. Our analysis and implications of the analysis are discussed below.

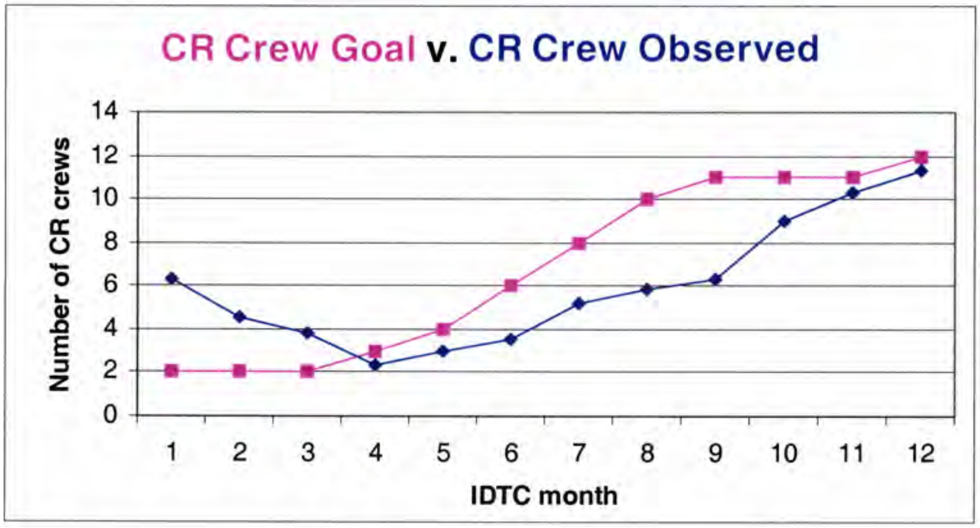
P-3C analysis and implications

We examined the relationship between the number of ASW on-station hours and achievement of Combat-Ready status. Our data set consisted of four squadrons and their respective IDTCs.

We first compared the stated goal of number of CR crews through the 12-month IDTC to the average number of CR crews per month (based on the four squadrons). The results are shown in figure 3.

The pink line shows the stated goal of the number of CR crews per squadron per IDTC month. The blue line shows the averaged number of CR crew from the four squadrons we examined. The IDTC begins with an average of six crews maintaining the CR status. These crews are "legacy crews," which means that they do not disestablish upon returning from deployment. Rather, they are permitted to bypass the TPC requirement as long as they maintain the ASW CR status.

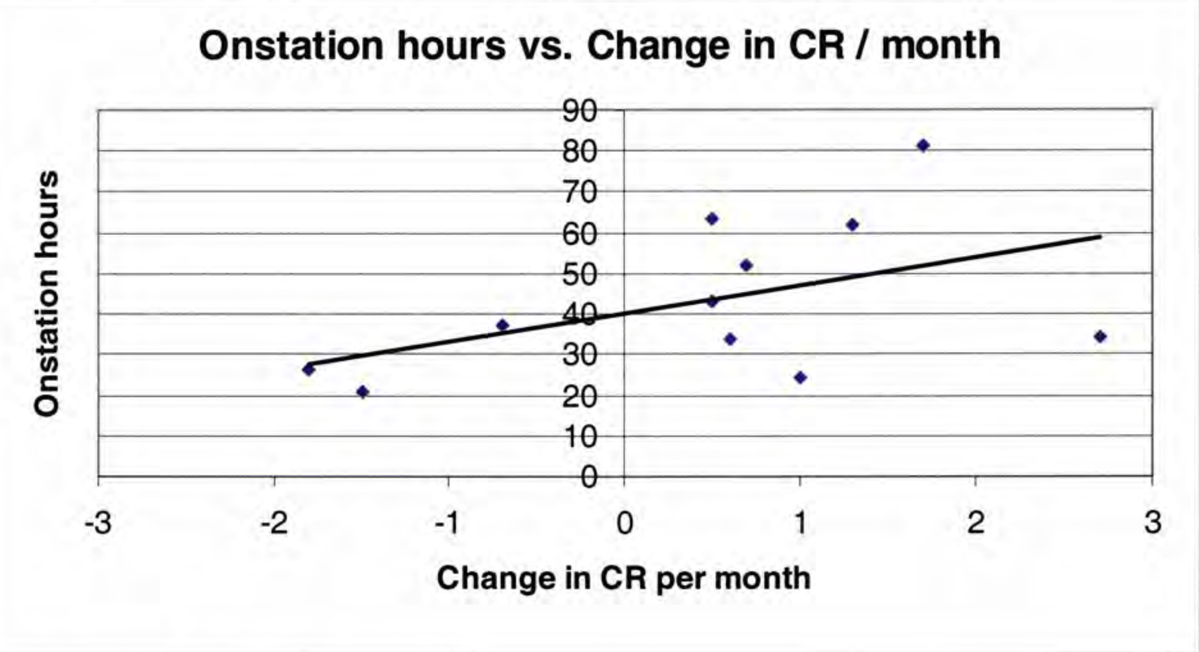
Figure 3. Number of Combat-Ready crews: goal vs. observations



However, as the months progress we see a decline in the number of CR crew. Finally, beginning with the sixth month there is a steady increase in the average number of CR crew. The result is a slight bathtub effect in measuring the CR status. (Again, CR status means that a crew has formed around the TACNUC, successfully completed TPC, and successfully completed at least three of the ASW qualification events.)

We next examined the slope or the change in CR crew per month of observed squadrons. We show this change in figure 4. Looking at the scatter plot we see a slight trend indicating a possible relationship between the two variables. An average of 40 on-station hours are required to maintain the same number of CR crews, and an average of 7 additional on-station hours are needed to increase CR status by one crew. Even with a low R-square of 0.2, indicating a weak relationship, subject matter experts concur with the relationship between on-station hours and CR status.

Figure 4. Correlation of on-station hours and number of CR crews per month[a]



a. The R-square for this scatter plot is 0.2.

Again we are using CR status as a proxy measurement for performance, and the source of those data is T&R qualification events. What this analysis does not reflect is the number of attempts it took the crew to achieve the qualification. Furthermore, the data do not reflect an objective quantitative measure of how well or how proficient the crew was in satisfying the qualification.

We also attempted to examine the relationship between the OSE grade and the number of qualification events. Our data set for this analysis is from 01 January 1999 to 30 June 00. During this time period more than half of the evaluated ASW OSE events were graded as pass/fail. There were a total of 813 ASW OSE evaluated events: 45 percent or 369 were numeric evaluations, while 55 percent or 444 were evaluated as pass/fail.

Out of 369 numeric graded events, 304 or 94 percent of the OSE grades were 85 percent or higher. Indeed, 83 percent of the OSE scores were in the 95 percent to 100 percent range. Table 2 summarizes our data.

Table 2. OSE scoring data[a]

			OSE scoring ranges (percentages)		
IDTC month	Number of events	Average score (%)	Below 85	85 - 95	95 - 100
1	2	98.6	0	0	2
2	5	91.9	1	1	3
3	13	99.1	0	0	13
4	15	94.4	2	1	12
5	15	94.2	2	3	10
6	30	97.0	0	4	26
7	44	95.7	4	2	38
8	42	97.2	1	6	35
9	37	95.3	3	7	27
10	37	94.1	3	4	30
11	96	96.4	6	11	79
12	32	98.1	0	3	29
Totals	369	96.2	22	42	304
Percent of total	n/a	n/a	6%	11%	83%

a. Source: Commander Patrol and Reconnaissance Force Atlantic (CPRFL)

Table 3 shows the comparison of OSE grades from three time periods. The first scores are 1985, when ASW was considered to have peaked and crews had a lot of ASW exposure. The second OSE scoring data, are 1990, are from shortly before the MARPAT community introduced TPC to the work-up cycle. The third period is from the most recent IDTC cycle. The data include both IDTC and deployment training and real-world operations.

Over the past 15 years the number of MARPAT squadrons has declined from 12 to 6, thus reducing the number of crews. We also see a decline in the number of ASW events per crew per month. Even with these reductions we do not see a decline in the average OSE grades. The average for all three is well above the minimum of 85 percent required to pass.

Table 3. Comparison of OSE scores[a]

	1985	1990	1999[b]
Average number of crews	96	96	48
Average ASW events per crew per month	1.6	1.2	0.9
Total on-station hours[c]	22,517	14,408	4,361
Average OSE scores	98%	94%	96%

a. Source: Commander Patrol and Reconnaissance Force Atlantic (CPRFL)

b. The 1999 data cover the time period 1 July 1999 - 30 June 00.

c. Total of both IDTC and deployed on-station hours.

P-3C ASW implications

The existing fleet data sources we found are generated from qualification events in training to the T&R matrix during the IDTC. That training is structured around developing crew coordination beginning with TPC and then on obtaining and maintaining CR status. We found consistent data on crew qualification rates and resources (event hours). From this qualification data we identified a relationship between CR status and on-station hours.

The evaluation is based on a reconstruction and debriefing of the event, which, as we have seen in other studies, is a valuable learning tool [5]. However, the evaluations are based on qualification vice quantifiable proficiency measures and are essentially a "pass" or "fail". Even with most recent OSE scores, one cannot calculate a prediction or probability of success.

The current data collection efforts do capture how the training hours are being spent, and illustrate focus of training effort. For example, while both dedicated training and fleet exercise training are readiness qualification opportunities, most ASW qualifications occur through dedicated training. Only 15 percent of the qualifications come from fleet exercise on-station hours. In terms of hours, 32 percent of ASW on-station hours are from fleet exercises.[2] Clearly, dedicated training provides a better opportunity to obtain the

2. The source of this information is CPRFL.

qualification. This information may be helpful in forecasting future resource allocation decisions, but it does not a measure a crew's proficiency in performing an ASW mission.

To link proficiency with resources we need objective quantifiable measures of performance. An example would be tracking the miss distances for an ASW-4 event, where the crew employs a weapon against a submerged target simulating a submarine. Tracking this information over time for multiple crews would generate sufficient data to correlate with the already-sufficient resource data.

Surface combatants

This section discusses the analysis done on training effort and surface combatants' NSFS amphibious warfare mission. The NSFS mission involves a surface combatant firing against an ashore target in support of an amphibious assault or maneuvering ground forces. Here we attempt to identify a link between the training effort for this mission and the proficiency in performing the NSFS mission. We found sufficient NSFS data to attempt to correlate resources to a performance measure.

We use data from the Atlantic Fleet training programs and units for our analysis. Where appropriate, we describe the training differences between the Atlantic and Pacific fleets. Because of these differences we did not analyze the Pacific Fleet resource and performance data; the comparison between the two is not valid given the difference in the training opportunities.

This section is divided into four sub-sections. In the first, we summarize the NSFS training program and requirements (including a description of the NSFS teams). Second, we describe our data collection. Third, we describe the specific methodology applied to this portion of the study and data sources used for the NSFS analysis. In the final sub-section, we discuss our results and the implications for NSFS.

NSFS training program and requirements

The East Coast and West Coast units follow similar NSFS training programs (we note the differences below). The training begins with a course taught by the Expeditionary Warfare Training Group Atlantic and Pacific (EWTGLANT/EWTGPAC). This course consists of both classroom and simulation training.

Training and Readiness

The Training and Readiness manual for surface combatants describes several amphibious warfare missions [6]:

- AMW-1 (non-fire NSFS rehearsal)
- AMW-2 (live-fire)
- AMW-3 (live-fire refresher).

The T&R manual provides guidance on when the training should take place. These timeframes correspond to the IDTC basic, intermediate, and advanced training phases. (See appendix B.) In addition the manual has a repetitive training category for refresher training prior to deployment. The NSFS training can occur in any of the phases. More detail is provided in the following section [6].

Training program

The training follows a building block approach. The initial training is in a classroom environment with a simulation event (AMW-1) at the end of the course. The course is taught by the Expeditionary Warfare Training Groups (LANTFLT and PACFLT). The NSFS team must successfully complete this course within 90 days of executing a live-fire exercise. The EWTGs also have a mobile training teams (MTTs) that provides ship-board training to the NSFS team and provide additional training prior to the live-fire qualification exercise (FIREXs). In addition, MTTs are available on request to provide one-week refresher courses, lectures, and simulation events, to NSFS teams [6].

Table 4 summarizes the training requirements based on "M" readiness ratings. In general, once a ship successfully completes the required training as described above, it remains M-1 in NSFS for 12 months. For the next 6- months, if no training is conducted the rating falls to M-2. After another 6- months without NSFS training, the ship is M-3. If another 6- months goes by without NSFS training, the ship receives an M-4 rating. If at anytime during the second 12- months a ship is able to conduct NSFS evaluated- raining, it again is M-1 for 12- months [6, 7].

Table 4. Surface training & readiness qualifications and ratings

M-status	Qualification event	Duration of status
M-1	AMW-1, AMW-2	12- months
M-2	n/a	6- months
M-3	n/a	6- months
M-4	n/a	6- months

Once a ship successfully completes FIREX I, it is considered M-1 for a 12-month period. Over the next 12 months the M-1 readiness rating degrades to M-4, unless the ship successfully completes a FIREX II; then it remains M-1 again for 12 months.[1]

The next training events are the live-fire exercises (FIREX I and II). FIREX I comprises 11 missions where each fire mission is graded by an evaluator. The missions range from calls for fire (including adjust fire), to area targets, to point targets. FIREX II includes five of the 11 FIREX I missions. Table 5 summarizes the FIREX missions. There is some variation in missions between the East and West coasts [8]. For example, PACFLT does not fire *danger-close* or *reduced-charge* missions, and LANTFLT does fire these missions.

More details on the FIREX qualification exercises are provided in the next section.

NSFS resource and performance data sources

Above we described the NSFS training program and requirements. Based on that information, we identified the following resource and performance data sources as a means of identifying a candidate metric for measuring proficiency.

1. Personnel turnover can also affect M-ratings and thus cause the NSFS team to need refresher training. For each gunfire control system, critical personnel are identified; a loss of one of these team members can trigger the requirement for refresher training [6,7].

Table 5. FIREX missions

SURFLANT FIREX	SURFPAC FIREX
Scheduled target	Scheduled target
Beach neutralization	Beach neutralization
-	Grid
Polar	Polar
Shift from known point	Shift from known point
Re-fire	Re-fire
Fresh target shift	Fresh target shift
Counter mechanized	Counter mechanized
Counter battery	Counter battery
-	Suppression of Enemy Air Defense
Illumination	Illumination
Danger close	-
Reduced charge	-

Resource data

For NSFS there were several variables considered to measure training expenditures. We considered the number of steaming days to get to the range, the number of rounds expended, and the number of training opportunities.

Steaming days didn't seem to apply because the East Coast ships use the Atlantic Fleet Weapons Training Facility (AFWTF) Vieques training range (the only range on the East Coast where NSFS can be conducted). It takes a minimum of three steaming days to reach Vieques. In recent years ships have been doing their NSFS qualifications while in the Puerto Rico Operating Area, combining it with other exercise opportunities (COMPTUEX, for example). For these reasons we disqualified number of steaming days as a training expenditure variable.

We concluded that the best variable would be the number of rounds expended. One data source for rounds expended is the FIREX qualification exercise. We describe this in more detail in the NSFS analysis section. An additional data source was the Conventional Ammunition Inventory Management System (CAIMS).

Performance data

We relied on the firing scores (not including the communication points) as a proxy measure for proficiency. (The assumption being that the higher the firing score is the more proficient a ship is in NSFS.)

The FIREX events are qualification exercises. Therefore, each mission is graded individually, based on a point system. A total of 790 points is possible, with the firing score being the percentage of the total points. In addition to the firing score, there is a final score which adds communication points (up to 50 points) to the firing score. Thus, it is possible to receive a final score over 100 percent [8].

The scoring is done by AFWTF personnel and is based on their observations. Raked targets are not used. An example category where points are awarded is rounds fired for effect. A "hit" is defined as the round landing within 50 meters of the target and the measurements by points are:

- 3 hits 15 points
- 2 hits 12 points
- 1 hit 10 points.

For FIREX I, each mission is allowed to be re-fired once and a minimum score of 60 percent is required to pass. Overall, a minimum score of 70 percent (firing score plus the bonus communication points) is required for NSFS qualification. See appendix B for examples of the scoring data forms [8].

Here are some of the factors that lead to point penalties:

- Having system problems
- Having firing delays
- Failing a firing mission
- Firing additional rounds.

In the next section we describe our findings from the analysis. The final section discusses and summarizes the issues we came across in using the firing scores and rounds fired to attempt to measure proficiency.

NSFS analysis and implications

Number of rounds fired as a resource variable

The Atlantic Fleet Warfare Training Facility (AFWTF) maintains current FIREX qualification data. These data consist of the number of rounds fired per mission (including initial PAC rounds); the overall firing score; and the final score, which can include the 50 bonus communication points. See appendix C for a sample of the scoring data sheets.

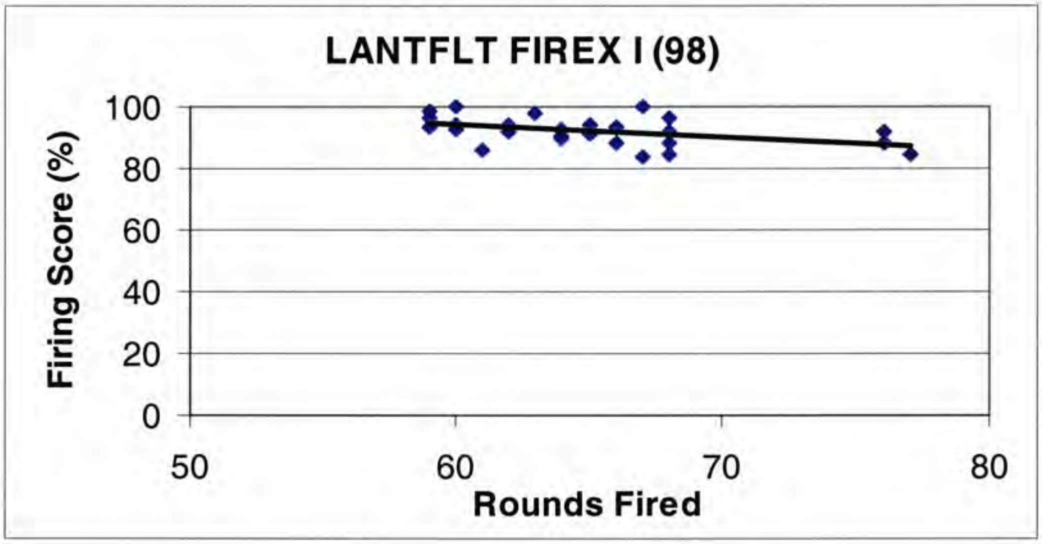
FIREX firing score as a performance variable

We conducted a regression analysis to determine whether a relationship exists between the resource data and performance data variables. We ran this regression based on two accounts for rounds fired. The first uses only the rounds fired for the actual FIREX. The second accounts for the total rounds fired during the exercise, thus includes the pre-action calibration (PAC) rounds. In addition, the analysis includes several additional data points we have from other years. The purpose of distinguishing between the two is that we don't know whether or not the PAC rounds were fired on the range or in the open ocean.

We used a simple linear regression to determine whether there was a statistically significant relationship between the resources expended (our X variable or independent variable) and our proxy for proficiency, firing score (our Y variable or dependent variable). Our results are summarized in figure 5.

Focusing on the scatter plot in figure 5, we can see no apparent trends that might signify a potentially significant relationship between the two variables. Fitting a regression line to the data, we calculated an R-square, or correlation coefficient of 0.2, which means that roughly 20 percent of the variability in the firing score can be explained by the number of rounds fired. In other words we found no statistically significant relationship between resources expended and proficiency (at the 95 percent level of confidence). Stated another way, we cannot accurately predict proficiency based on the number of rounds fired during the FIREX.

Figure 5. NSFS rounds fired v. FIREX scores[a]



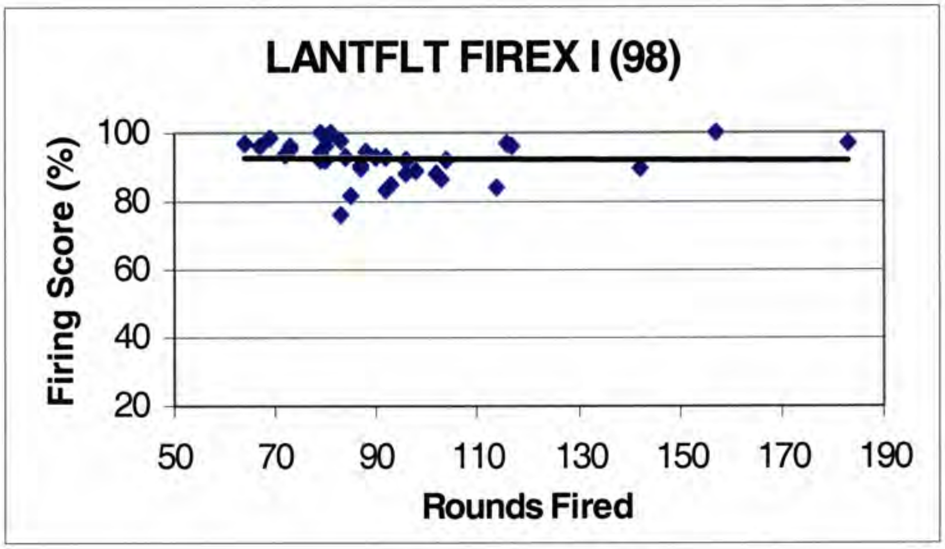
a. The R-square for this scatter plot is 0.2.

Although not statistically significant, there appears to be a slight trend in the number of rounds fired and the score. In general the more rounds fired the lower the score. While this is a useful insight into the number of rounds fired and the score, it is important to note that all of the scores are well above the minimum 70 percent required to pass the qualification and that these data represent only the successful completion of the FIREX qualification. In other words, the data do not take into account whether any of the ships failed the FIREX qualification prior to successfully completing it.

Figure 6 is a graphic depiction of the second regression (PAC rounds included).[2] We calculated an R-square of 0.0004, meaning that less than a half of one percent of variance in the firing score is described by the total rounds fired.

2. The second regression includes several ships not included in the first regression. They were removed because total rounds fired couldn't be distinguished from PAC rounds fired.

Figure 6. NSFS rounds fired (including PACs) and firing score



However, because this provides only a snapshot of the final training, we searched for other quantifiable data sources that we could measure against the FIREX score. These additional variables and our results are described below.

Other NSFS variables

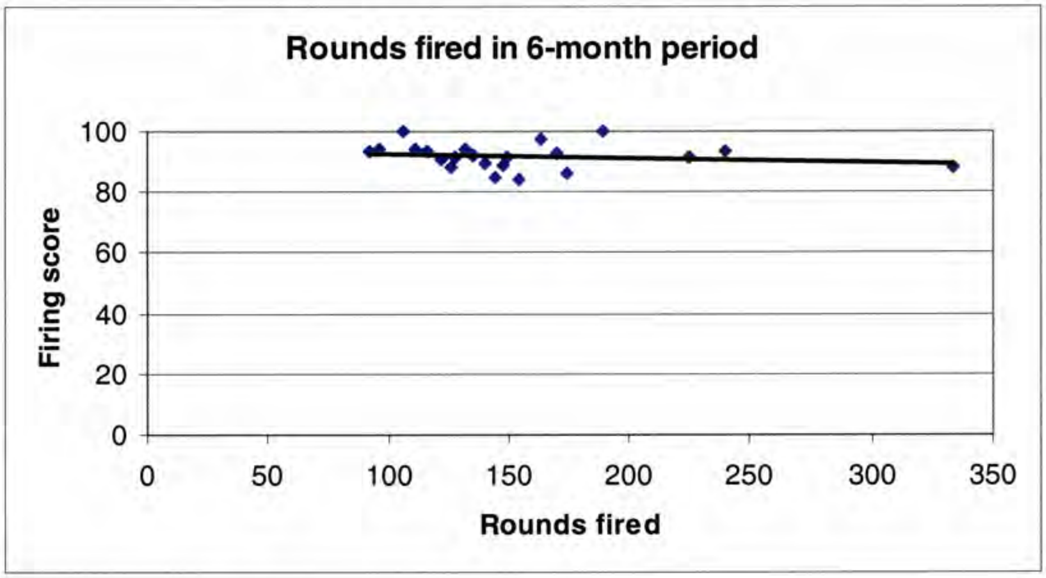
We examined the possibility of measuring tactical proficiency through resource variables. For NSFS our resource variable was rounds fired. We expanded the resource variable to include a count of all rounds fired 6 months prior to the live-fire qualification (FIREX I). This information was obtained from the Conventional Ammunition Inventory Management System (CAIMS). We also analyzed the number of times ships failed either the EWTGLANT course or the FIREX. We define this latter variable as the training level of effort.

CAIMS

The CAIMS database is an inventory management tool. Each ship is required to track or account for each weapon or round it employs, and that information is maintained in the CAIMS database.

Figure 7 shows a scatter plot of the rounds fired in the 6- months prior to the FIREX and the FIREX firing score. The data distribution is similar to what we found when attempting to correlate FIREX rounds and the FIREX firing score (figure 6). Again we did not find a strong relationship between the two variables.

Figure 7. Correlation between CAIMS data and FIREX score[a]



a. The R-square for this scatter plot is 0.03.

The drawback to using CAIMS is that it does not track for what purpose the round or weapon was employed. For example, we have identified that a ship fired 189 rounds in the 6- months prior to its FIREX qualification, but we cannot distinguish if the type of training being conducted as this information is not recorded. The implication being, we don't know if the NSFS procedures were being trained or whether Anti-Surface warfare procedures were being trained.

Furthermore, there are no applicable performance data to measure against the general resource data. However, this information does provide some insight into how often the gun was fired. Anecdotal evidence indicates that a gun that is fired often performs better than a gun fired infrequently. This may be due to the regular maintenance the gun would receive from frequent employment.

Training level of effort

Another potential variable is a ship's or gunfire team's training level of effort. On a limited basis we were able to quantify the level of training effort for the same 1998 FIREX ships. Table 6 summarizes the available data. The number of training attempts is based on the number of times it took a ship or NSFS team to satisfactorily pass the Expeditionary Warfare Training Group, Atlantic NSFS course (classroom and simulator) and the number of FIREX attempts. We devised a simple scale:

- 0 means no data were available
- 1 means the ship or team passed the course on the first attempt
- 2 means it took two attempts to pass
- 3 means it took three attempts to pass.

The data sets are very small and therefore yield no statistical significance. But for comparison sake, we include them here.

Table 6. Training level of effort

Training value	Sample size	Average Score (%)	Standard Deviation
0	3	95.49	4.34
1	19	91.45	4.16
2	4	94.32	5.08
3	1	86.10	n/a

The data above account for only a known or identifiable training level of effort. What this does not account for is the amount of training conducted independently by the ship. The ship does have the capability to run NSFS drills practicing the communication procedures and NSFS processes within the ship's NSFS team. Ships do not track this information; nor do they have a performance measure which to objectively grade their performance.

NSFS implications

The structure of the scoring of the FIREX lends itself to being able to calculate a probability of success, in terms of hitting the target. However, because of the small number of training opportunities, it is not possible to establish a representative learning curve.

The existing fleet data show a snapshot of the final NSFS training event prior to deployment. There are no quantifiable data sources for the earlier training event, classroom and simulator training. That is not to say that the earlier training is not closely evaluated, but that the evaluation is based on individual skills and coordination among the NSFS team. It is not a numeric quantitative assessment; nor is there a score for the simulated NSFS. Neither maintain numeric quantitative assessment data.

The limited number of training opportunities does not appear to have a negative impact on the training as the NSFS firing scores are quite high with an average of 92 percent. Also the number of training failures (attempts) as summarized in table 5, illustrates how seldom NSFS teams fail the training. Even with the small data set and at least one failure, the average firing score is still close to 100 percent.

A potential means for establishing a link between proficiency and resources for NSFS, would require collecting individual ship training data (NSFS drills, EWTG courses) and correlating the level of training effort to FIREX scores. This requires setting up the procedures early in the IDTC for collecting it. A sample data collection entry could be the number of times the ship or team trained to the mission, i.e., how often it practiced the communication and coordination among the NSFS team members. *This information is* *not an existing fleet data source.* Examining the number of training opportunities prior to the live-fire qualification event, could potentially provide more insight into what affects proficiency.

Strike-fighter aircraft

For the F/A-18 tactical aircraft (TACAIR) portion of this study, we applied the same approach as described in the introduction. Again, our objective is to identify a candidate or proxy metric for measuring warfighting proficiency. The mission focus for TACAIR is strike warfare. Our data sources included both resource data and performance data.

We identified a carrier air wing that was in the process of working up for a deployment as our primary data source. We chose this route as the best possible means of collecting current data for both the resources and the recent performance data. We collected data from a seven month time period that covered unit-level training and major training exercises.

In this section we first outline the F/A-18 strike-fighter training requirements governed by the T&R matrix. Second, we describe the type and sources of existing fleet data we analyzed. Third, we summarize our analysis and identify the implications of our results.

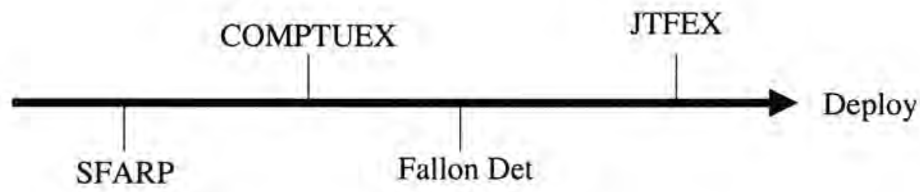
Strike warfare training

The TACAIR community is structured differently from the MARPAT force described previously. TACAIR performs different missions and has different training requirements. For the purposes of this study, we view a strike-fighter squadron as a single unit. Figure 8 shows the general training timeline.

Training and Readiness matrix

The squadrons use the T&R matrix as a training management tool as well as a means to track readiness. We again relied on the T&R matrix to structure our data collection effort.

Figure 8. Strike-fighter training timeline



The F/A-18s participate in several training events during the IDTC in addition to their unit-level training. The events flown during this period are recorded via the T&R strike categories. To extent that the data exist, we collected data from the larger training events and unit-level training events.

Table 7 shows the T&R strike-warfare training events STW 01 through STW 10, which cost flight hours. Table 8 shows the remaining strike warfare actions STW 20 through STW 52, which are executed in conjunction with events STW 01-10. Strike warfare actions do not cost flight hours. The T&R matrix calculates a sortie hour of 1.5 for each event [4].

Table 7. F/A-18 T&R strike warfare events[a]

T&R Event	Description
STW 1	STK-4(2)n
STW 2	STK-4(2)se
STW 3	STK-4(2)
STW 4	STK-4/2
STW 5	Target acquisition
STW 6	CSAR (combat search and rescue)
STW 7	Target attack
STW 8	Low altitude tactical training (LATT)
STW 9	HARM
STW 10	STWSIM

a. Because we are focusing on strike warfare, we did not include the other Primary Mission Areas in this table.

Table 8. F/A-18 T&R Strike Warfare Actions

T&R action	Description
STW 20	Night vision device low level
STW 21	Day low level
STW 22	Laser spot tracker (LST)
STW 23	Surface-to-air electronic threat
STW 24	Air-to-ground strafe
STW 25	Paraflare bombing
STW 26	Precision guided munitions (PGM) expenditure
STW 27	Laser guided training round (LGTR) expenditure
STW 28	Laser Maverick profile
STW 29	IR Maverick profile
STW 30	Walleye profile
STW 31	Standoff land attack missile (SLAM) profile
STW 32	MK-80 series expenditure
STW 33	Rockets expenditure
STW 34	Cluster weapons expenditure
STW 35	Laser guided bomb (LGB) expenditure
STW 50	Coordinated strike
STW 51	Air wing weapons detachment (CVW) Fallon
STW 52	SFARP

Squadron funding is in the form of flight hours. The F/A-18 T&R matrix uses a 1.5 sortie hour as a basis for its funding. Other communities, F-14s for example, assign a flight hour value to individual sorties. Flight hours are divided into two types, event hours and transit hours (also referred to as overhead hours) [4].

Squadrons are funded based on flight hours; therefore, we focused on time in terms of event hours flown per event as well as time in regards to the larger training events. In the next sub-section we discuss our resource data collection effort.

Resource data

As with NSFS, we had a number of options to use as a resource variable, including event hours or flight hours and weapons employed. Our source for these data was the SHARP database, which is a software program designed to facilitate the tracking of resources.

In addition SHARP is used as management tool to assist the squadrons in tracking currency periods and readiness or SORTS reporting.

The F/A-18 Wing Training Manual is a new addition to the training documentation. It describes each T&R event and action as well as a set of measures of performance and measures of effectiveness. However, there is no numeric scoring for either measure [8].

SHARP database

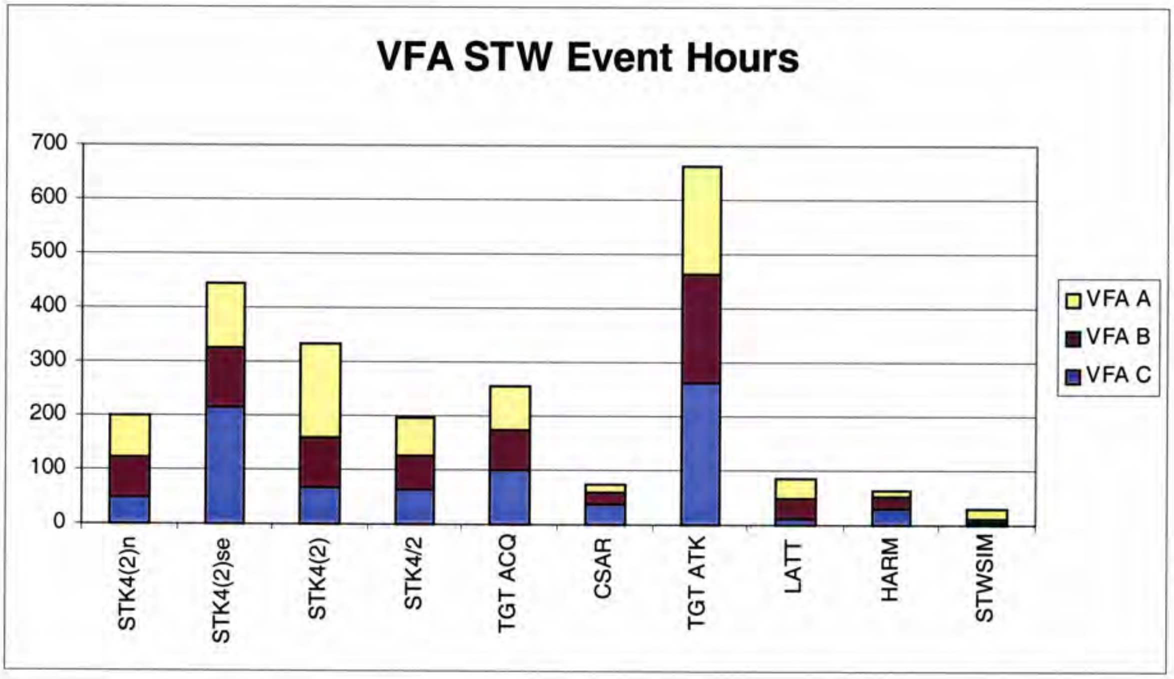
The SHARP program is designed as a management tool for both the Type Commands (AIRPAC/AIRLANT) and the individual squadrons. The Type Commands maintain an aggregated database for the different platforms. The squadrons use SHARP for the day-to-day management or tracking of their flight activities. For speed and efficiency we focused our data search at the squadron level. As our focus is strike warfare, we collected data from the strike-fighter squadrons—three VFA squadrons. Appendix C provides a sample of the type of data obtained from SHARP.

There are multiple versions of SHARP in circulation. We found that each squadron had a different version of SHARP, but this did not affect our data collection efforts. More importantly, we found that each squadron developed and used its own rules for recording flight data. SHARP allows the program administrator to set up the rules that govern how the user (or pilot) combines multiple events into one sortie entry. This is commonly referred to as "chaining."

As we described in the Training and Readiness sub-section above, the F/A-18 T&R matrix is divided into two categories: events and actions. The events (STW 01 through STW 10) have a flight hour cost. As described above, a sortie on average is 1.5 flight hours. The actions do not have a flight hour cost associated with them. The actions are designed to be linked or chained to the events. We found this to be the case in the SHARP data we collected. For example a STW 32 (MK-80 series expenditure) action can be chained to or recorded with a STW 4 event.

We noticed that squadrons were also chaining multiple STW events in addition to the STW actions. Not all STW events are created equally. Some of the events such as STW 4(2) and STW 4(2)se, are full strike missions, whereas STW TGT ACQ (target acquisition) and TGT ATK (target attack) are pieces of a larger strike mission. Figure 9 summarizes the STW data we collected. It shows the detailed breakout of the STW event hours for the 7- month time period we looked at.

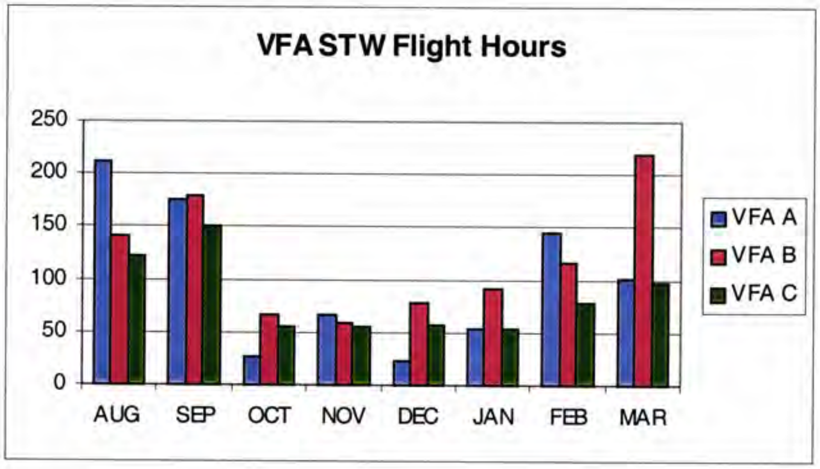
Figure 9. SHARP derived strike fighter strike warfare event hours



The numbers reflect the number of flight hours dedicated to each STW event. The chart shows that squadrons, with little variation, divide the focus of training effort on similar events.

In determining how many hours and sorties were devoted to STW over a defined time period, we used the average 1.5 sortie hours. In reviewing the details within the SHARP database, we were not always able to clearly distinguish between the two; therefore, we used the average 1.5. In addition, because we were unable to distinguish which events were training and which were overhead, for the purpose of showing the training level of effort over time, we had to combine the training category and overhead categories. Figure 10 shows the level of training effort in strike warfare over time. For reference, the squadrons participated in SFARP during September; COMPTUEX between January and February; and Fallon Det during March.

Figure 10. SHARP derived strike-fighter STW flight hours



Performance data

In collecting performance data, we focused on the same three VFA squadrons that we used to obtain SHARP data.

SHARP contains bomb scoring categories as entry windows and we first searched here for aircrew strike performance data. However, the squadrons did not record this information in SHARP. We then focused on gathering performance data from the training exercises. We collected performance data on three of four major training exercises:

- SFARP
- COMPTUEX
- Fallon Detachment.

In the next section we discuss each exercise in more detail and provide examples of the performance measures.

TACAIR analysis and implications

Despite identifying both a resource variable and a performance variable—flight hours and bombing percentage, respectively—we were unable to identify a correlation between these two variables. There are several reasons for this. In this section we examine those reasons.

SHARP serves as a management tool for the squadrons. It tracks a variety of information, for example:

- T&R events flown
  - Periodicities
  - Primary Mission Area (PMA) points
- Ranges used and time used
- Weapons employed
- Flight hours
  - Event hours
  - Transit hours.

All of this data depend upon the aircrew entering the information or recording their flight information. At the squadron level there is general guidance on how to record the information; however, beyond that there is no common definition or guidance on how or what to record.

The best example of this is in recording bomb hit scoring. Our data set included 1,029 sorties employing weapons and only 16 of those entries had scoring data. (We do not know how the hits were scored. They may have been based solely on aircrew observation or may have been a score passed from a scored range.)

Theoretically, it is possible to identify a learning curve for individual pilots as they progress through the IDTC. However, to do so would require aircrew to record all of their bombing mission scores. Furthermore, that would require a standard objective measure for all aircrew to apply. But again this would require the aircrew to record their bomb hit scores. The squadrons we tracked did not do this.

Comparing the performance data

As mentioned previously, we identified three sources of performance data: SFARP, COMPTUEX, and the Fallon Det. These are the major TACAIR training IDTC training events. (The final major training event is the JTFEX. We do not have data on the VFA squadrons performance for this event.) Of course, these events are not the only opportunities for aircrews to train. Aircrews also train using what is often referred to as "backyard" ranges for unit squadron-level training. This type of training is not tied together with a larger scenario (like JTFEX); nor is it necessarily integrated training (like COMPTUEX); nor is it a formal school training (like SFARP). The training is continuous throughout the IDTC.

To compare performance of the VFA squadrons from these training exercises, we first need to identify a common denominator shared by them. We found that each uses a slightly different measure of performance. Upon closer examination of the events, we found that the measures reflect the focus of effort of that particular exercise during the work-up cycle. This has a direct implication for attempting to identify a learning curve of performance or proficiency. We discuss the significance below.

SFARP

The SFARP training is conducted by the Strike Fighter Weapons School, Pacific. It consists of a ground school phase and a flying phase. For the purpose of this study we focused on the strike performance during the flight portion of SFARP. The training takes place during the basic phase of the IDTC. See figure 8 (the training timeline).

The focus of effort during SFARP is on individual aircrew skills. Specifically, for strike warfare the focus is the aircrew's ability to properly employ the weapon systems.

The flight portion of SFARP consists of 14 events. Four of the events are air-to-ground ordnance delivery only, six events are air-to-air simulated shot events, and four combine both elements air-to-ground and air-to-air missions. Again we focused the events with a strike element. SFARP does not use raked target scoring. Experienced observers' record and track the scoring data [10].

The basis for the scoring is the circular error probable (CEP). SFARP calculates CEP from the middle hit of sample being observed. Each aircrew is measured individually, and a squadrons is measured as a single unit combining the individual aircrew scores. The different types of delivery (visual, FLIR, and laser) are measured. Each has an associated "benchmark" of performance. For example, the benchmark for visual and FLIR deliveries is 100 feet [10].

We converted these scores into an overall percentage of the number of pilots that dropped bombs within the stated SFARP benchmark. Figures 11 and 12 are samples of SFARP performance measures. We aggregated the three squadrons and show FLIR and visual bomb deliveries. The x-axis shows the upper bound of the CEP ranges. For example, in the FLIR distribution, 17 pilots hit the aimpoint outside of 12.5 feet, but within 50 feet. Based on the SFARP data, we calculated that 60 percent of the aircrews' bomb deliveries were within the SFARP benchmark.

Fallon Detachment

The Fallon Det provides an opportunity for the airwing to train as a single unit. The training done previously focused on squadron-level or individual-level training. During the Fallon Det, the focus of the training shifts to integrating the different air platforms (E-2Cs, S-3Bs, and EA-6Bs) to execute strike missions—thus, adding an element not present during SFARP. The focus of effort during Fallon Det is not only operating with other types of aircraft but also learning the planning skills of how to integrate (strike mission process).

Figure 11. SFARP performance measures (FLIR)

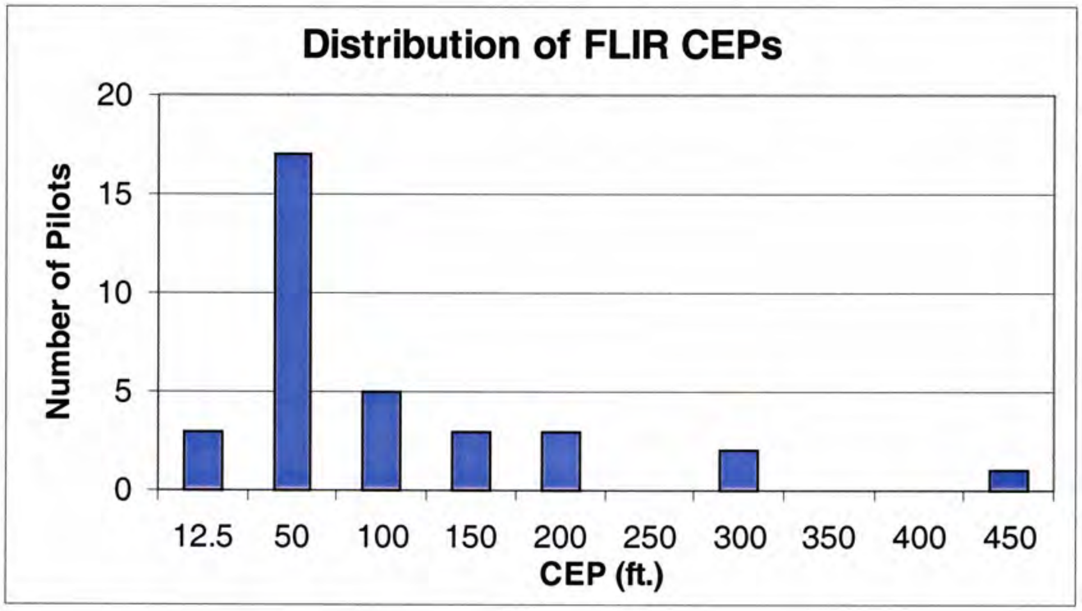
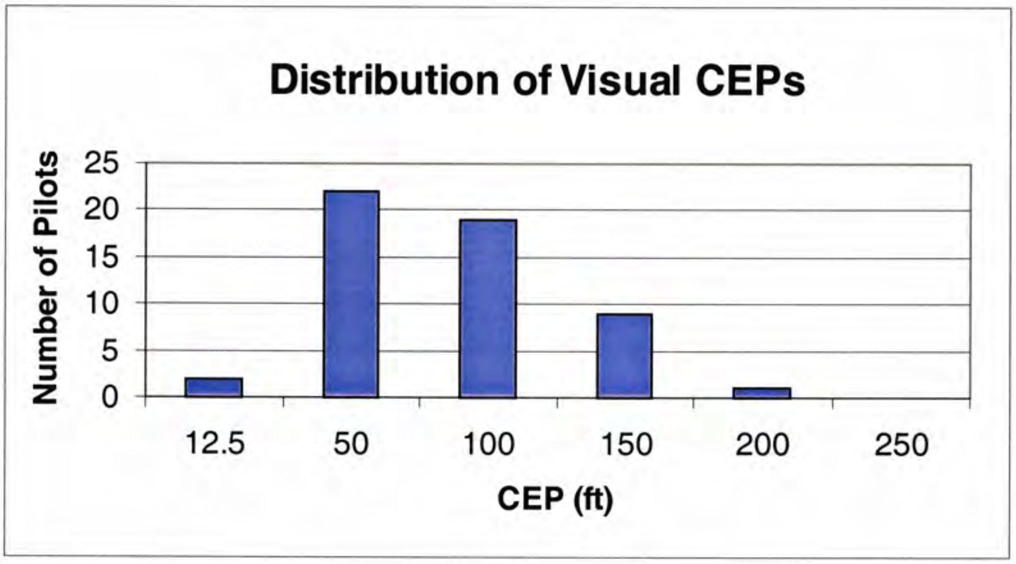


Figure 12. SFARP performance measures (visual)



NSAWC uses a graduated training syllabus. It begins with Mission Level Training (MLT) where the integrated airwing focuses on specific mission areas. In addition, during this phase NSAWC instructors provide the strike plans to the airwing. The focus of the training for the airwing is on executing the pre-planned strike [11].

The next training phase, the Integrated Training Phase (ITP), introduces the strike planning process to aircrews. During this phase the events are stand-alone events, i.e., they are not woven together in a larger scenario. One event does not influence the next event. The third phase is the Advance Training Phase. Unlike the previous phases, ATP is a scenario-driven event. The CAG staff is responsible for developing a concept of operations for the scenario. The events are linked together (i.e., one influences the other). This is the closest deployment-like training to date [11].

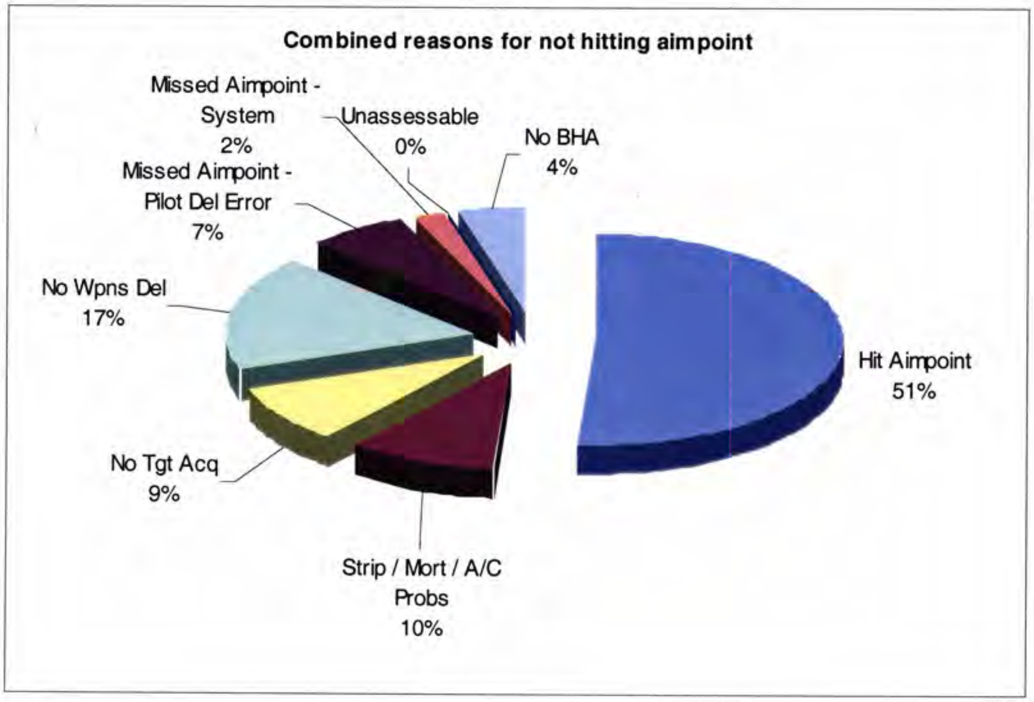
Gradually through the different phases more and more skills are being added to the events. During MLT, the focus is on the execution skills; aircrews don't do the plan or the briefing. During ITP and ATP, aircrews incorporate more mission skills by doing the planning and then executing the plan. In addition, they learn the training coordination skills needed to integrate with the other airwing assets during planning and execution.

The airwings are evaluated on their performance during each phase of Fallon Det. Then scores are combined at the end for an overall grade. The measurement is based on the total number of sorties planned for the mission or event.

To determine the overall number, the total number of all sorties planned for the Fallon Det exercise is used. From this total number, percentages are derived from the number of sorties that actually reach the target area and drop their weapons within 50 meters (or 164 feet) of the target. The reasons for not reaching the target are recorded and percentages determined. Sample reasons include strip abort, hung ordnance, failure to acquire the target, or poor weather. Figure 13 is an example of scoring data from the Fallon Det.

We used the overall bomb hit percentage (51 percent) as our measurement for Fallon Det performance.

Figure 13. Fallon Det performance measures



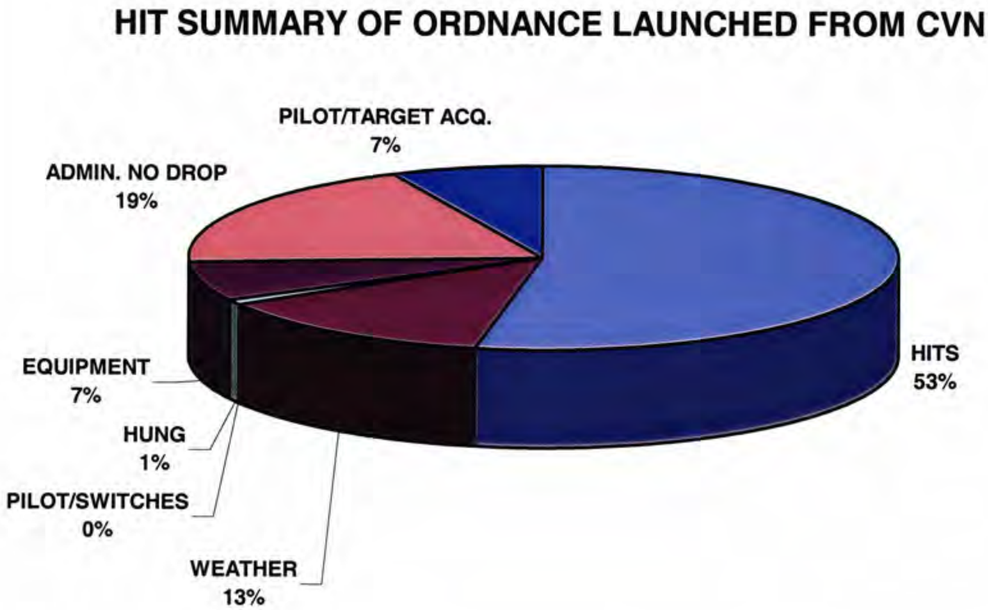
COMPTUEX

The final TACAIR training exercise we examined was COMPTUEX. COMPTUEX is conducted during the intermediate phase of the IDTC. It comprises a series of events training multiple warfare areas. These events are not linked together in a single scenario. This is significant in that the outcome of one event does not impact the next event.

COMPTUEX integrates the airwing and the aircraft carrier personnel into a single team. Up to this training exercise, training has been stovepiped among units of the deploying battle group. Because COMPTUEX takes place at sea, it provides an opportunity to integrate all of the battle group elements. However, the focus of the training is on the separated warfare mission areas.

The airwing's performance during COMPTUEX is evaluated by COMCARGU-1. As with SFARP and Fallon Det, the evaluation is a percentage-based score. However, the percentage is not based on the number of sorties; rather, it is based on the number of bombs that hit the target. The bomb hit percentage for COMPTUEX was 53 percent. Figure 14 is a sample of the COMPTUEX performance data from the carrier airwing.

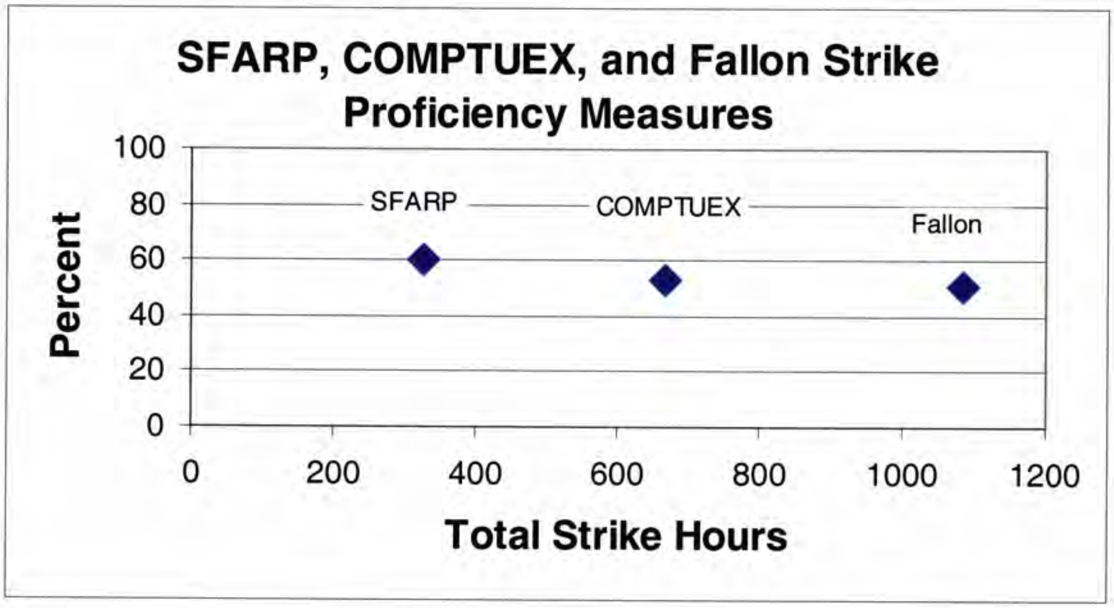
Figure 14. COMPTUEX performance measures



All three training evolutions measure strike performance based on the ability of the aircrew to hit the target. We used this as a starting point in looking for a common denominator to use in comparing the three performance measures. CEP is the common thread, but only two measures use the same criteria.

We show the comparison of the different performance data and the flight hours from SHARP data in figure 14. The total number of strike hours is an averaged cumulative total of the strike event flight hours during the 7-month period. The scoring percentage were discussed above. Disregarding the different training foci and CEP criteria, one could say there is a slight downward trend. However, given the fact that the focus of the training is different for each, we conclude that it is not viable to compare the three performances as a learning curve.

Figure 15. Fleet exercise strike proficiency measures



TACAIR implications

The purpose of this study was to use existing fleet data sources to determine whether a learning curve for strike warfare tactical proficiency can be established. As with the other portions of the study, we found valuable fleet data on resources. The resource variable in the correlation can be satisfied with the data currently being collected with SHARP. Collecting these data, is a step in the right direction, because the data capture training being conducted at the unit level in between the major training exercises.

As we examined the existing data from these three training events, we see that a learning curve is already assumed into designing the training program. This is seen in the progressive training programs from unit-level training, to SFARP, to Fallon Det, and finally to COMPTUEX. (The JTFEX exercise can be added to this list, as it is the graduation exercise for the deploying battle group.)

At each step of the training program, new skills are added. The focus of the training at SFARP is on the pilots ability to employ the weapon systems. During Fallon Det the focus shifts to integrating all of the air wing assets and CAG staff into the a single warfighting unit. Finally, for COMPTUEX, the focus on the training shifts to not only to air wing integration, but also integration with the carrier crew and other battle group elements.

If individual bomb scores were recorded in SHARP, consistently and in a reliable format, the data would exist to analyze not only individual exercise performance, but also individual performance in unit-level training.

Another step in the right direction is the addition of a wing-training manual with measures of performance and measures of effectiveness. Combining these criteria with the SHARP's capability for tracking individual data, it's conceivable to develop a database of individual performance measures. Currently, such a database does not exist.

The lack of individual performance data makes it impossible to calculate a probability of success of hitting the aimpoint. To show a learning curve through the IDTC, we need performance data on an individual level. An example is measurement, in time, of the degradation of bombing skills. Having such a measure could provide valuable information to decision-makers regarding resource allocation. Existing fleet data for performance measures, however, do not capture individual scoring data.

Wrap-up

We were tasked to attempt to identify a link between training resources and warfighting proficiency. We examined three different platforms and three different warfare missions. For each platform we found sufficiently detailed existing resource data sources and were able to examine different types of resources (flight hours for the air platforms and ordnance for the surface combatants). However, we did not find sufficient existing performance data sources for any of the platforms. Some performance measures exist, but not at the level required to attempt to identify a learning curve.

There are two possible solutions to establishing a connection between resources and proficiency. The first is to create new data collection requirements and establishing appropriate databases to capture quantifiable performance measures such as CEPs. The second is to set up a data collection plan for a chosen unit and follow that unit through its IDTC.

Establishing a connection between training resources and warfighting proficiency would be a worthwhile endeavor because of the valuable insights that could be gained. But, it would require a change in the type of data collected—meaning that the focus would need to shift to collecting data on quantifiable performance measures over time, rather than merely "checking a qualification box." Such a change would be a positive step toward establishing a link between training resources and warfighting proficiency.

Appendix A

This appendix contains a series of figures showing:

- The P-3C T&R matrix and event descriptions
- A sample OSE evaluation forms
- A sample of an ASW T&R qualification evaluation form.

P-3C Training Matrix

"T" LEVEL	T&R EVENT	EVENT TITLE	MEDIA	CREW	CURRENCY PERIOD (Days)	EVT HRS	ANN FLT HRS	ANN SIM HRS	MOB	ASW	ASU	INT	CCC	C2W	MIW	NOTES	ORDNANCE	ORD REQ	ANN ORD REQ	RESOURCES
4	MOB 1	FRS		ALL	ONCE				5	5	5	5	5	5	5	1				
4	MOB 2	PILOT TRNG	FLT/ (SIM)	PPC	30	3.0	36.0	6.0	20							2,3,4				2F87 OFT
4	MOB 3	PILOT TRNG/ SYLLABUS	FLT/ (SIM)	PPP	30	3.0	36.0	12.0	20							3				2F87 OFT
4	MOB 4	PILOT TRNG/ SYLLABUS	FLT/ (SIM)	PPCP	30	3.0	36.0	12.0	20							3				2F87 OFT
4	MOB 5	POSITIONAL NATOPS/ INSTRUMENT CHECK	FLT	PPC, PPP, FE, PPTC, PPNC, SS1, SS3, IFT	365	4.0	16.0	4.0	10							5	SSQ-36 SSQ-57 SSQ-53 SSQ-77 SSQ-62 EMATT	1 1 3 2 2 1	4 4 12 8 8 4	2F87 OFT/ 2F140 WST
4	MOB 6	PPIP SYLLABUS	FLT/ (SIM)	PPC	ONCE	4.0	16.0	9.0	5											2F87 OFT
4	MOB 7	AIRCREW PQS SYLLABUS	FLT/SIM	PPTC, PPNC, FE, SS1, SS3, IFT	ONCE	4.0	16.0	36.0	10							6	SSQ-36 SSQ-57 SSQ-53 SSQ-77 SSQ-62 Mk-25 SMK MK-58 SMK EMATT	1 1 15 6 3 2 1 1	4 4 60 24 12 8 4 4	CVTG/ARG/HS/ HSL/VS/ 2F140 WST
4	MOB 8	TPC	SIM	PPC, PPTC, PPNC, SS1, SS2, SS3	545			36.0	5	20	15	10	15	5	10	7				2F87 OFT/2F140 WST
4	C2W 1	NON-ACOUSTIC/ SURVIVABILITY	FLT	PPC, PPTC, SS3	120	4.0	12.0				5	10	10	15 EQ	10	8	NW20 or NW33, L540	30 30	90 90	
4	ASW 1	DIESEL/ LITTORAL WATER	FLT/SIM	TACNUC	120/G	4.0	12.0	4.0		20 G		5	5	5		9	SSQ-36 SSQ-57 SSQ-53 SSQ-77 SSQ-62 Mk-25 SMK MK-58 SMK MK-64/84 SUS	1 1 22 6 15 2 1 3	3 3 66 18 45 6 3 9	SS 2F140 WST
4	ASW 2	NUCLEAR/OPEN OCEAN	FLT	TACNUC	120/G	4.0	12.0			20 G		5	5	5		9	SSQ-36 SSQ-57 SSQ-53 SSQ-77 SSQ-62 Mk-25 SMK MK-58 SMK MK-64/84 SUS	2 1 40 6 5 2 1 3	6 3 120 18 15 6 3 9	SSN/SSBN
4	INT 1	MARITIME SURV	FLT	TACNUC	120	5.0	15.0				5	20 EQ	10	10		8	SSQ-53 SSQ-77	9 0	27 0	SURFACE
		T-4/T-3 TRANSITION				38.0	207.0	119.0	95	65	30	55	50	45	25					
3	ASW 3	ASW JOINT COORDEX	FLT	TACNUC, PPNC	120	4.0	12.0			15			10	10			SSQ-36 SSQ-57 SSQ-53 SSQ-77 SSQ-62 Mk-25 SMK MK-64/84 SUS	2 1 32 6 10 3 3	6 3 96 18 30 9 9	SS/SSN/CVTG/ ARG/HS/HSL/VS

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Figure 16. P-3C Training & Readness Matrix (continued)

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P-3C Training Matrix

"T" LEVEL	T&R EVENT	EVENT TITLE	MEDIA	CREW	CURRENCY PERIOD (Days)	EVT HRS	ANN FLT HRS	ANN SIM HRS	MOB	ASW	ASU	INT	CCC	C2W	MIW	NOTES	ORDNANCE	ORD REQ	ANN ORD REQ	RESOURCES
3	ASU 1	ASUN JOINT COORDEX	FLT/SIM	TACNUC, PPNC	120	5.0	15.0	4.0			20		10	10			CATM-H CATM-H			TARGET/ SURFACE
3	ASW 4	ATTACKEX	FLT/ (SIM)	TACNUC	545	3.0	3.0	4.0		10						10	SSQ-36 SSQ-57 SSQ-53 SSQ-77 SSQ-62 Mk-25 SMK MK-64/84 SUS MK-46/50 REXTORP	2 1 35 8 5 3 3 1	2 1 35 8 5 3 3 1	SS/SSN/SSBN/ RANGE/MK 30 SLED/2F140 WST
3	ASU 2	BOMBEX	FLT	PPC, PPTC	120	2.0	6.0				5				20		Mk-82 Mk-20 CBU-99 BDU-45 MK-58 SMK	1 1 1 1 2	3 3 3 3 6	
3	INT 2	DATA COLLECTION	FLT	TACNUC	120	[5.0]	[15.0]				5	20		5						
		T-3/T-2 TRANSITION				52.0	243.0	127.0	95	90	60	75	70	70	45					
2	ASW 5	EER	FLT/ (SIM)	TACNUC	120	5.0	20.0	4.0		5				5		11	SSQ-36 SSQ-57 SSQ-53 SSQ-77 SSQ-62 SSQ-110 Mk-25 SMK MK-58 SMK MK-64/84 SUS	2 1 40 15 5 15 3 1 3	8 4 160 60 20 60 12 4 12	SS/SSN 2F140 WST
2	ASU 3	HARPOON MISSILEX	FLT/SIM	PPC, PPTC, SS3	120	3.0	9.0	4.0			10		10				AGM/ATM-84 CATM-H	1	3	TARGET/ SURFACE
2	INT 3	BATTLEGROUP/LITTORAL SURV	FLT	TACNUC	120	5.0	15.0				10	20 EQ	10	10		8				
2	MIW 1	MINEX	FLT	PPC, PPTC, PPNC, SS3	545	2.0	2.0								50		BDU-45/ASST Mines	4	4	INST RANGE
		T-2/T-1 TRANSITION				67.0	289.0	135.0	95	95	80	95	90	85	95					
1	ASU 4	MAVERICK MISSILEX	FLT	PPC, PPP, PPTC, SS3	120	3.0	9.0				10		5	10			AGM-65 CATM-M	1	3	TARGET/ SURFACE
1	ASU 5	SLAM MISSILEX	FLT	PPC, PPTC, PPNC, SS3	120	3.0	9.0				5	5	5	5			CATM-S			TARGET
1	ASW 6	BEARTRAP	FLT/ (SIM)	TACNUC, PPNC	90	4.0	16.0	28.0		5						12	SSQ-36 SSQ-53 SSQ-57 SSQ-77 SSQ-62 Mk-25 SMK MK-58 SMK	3 36 20 4 0 1 2	12 144 80 16 0 4 8	SS/SSN/ SSBN/ 2F140 WST
1	MOB 9	FORM/ INTERCEPT	FLT	PPC	90	3.0	12.0		5		5				5					
		TOTALS				80.0	335.0	163.0	100	100	100	100	100	100	100					

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Figure 16. P-3C Training & Readness Matrix (continued)

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P-3C Training Matrix Notes

ABBREVIATIONS

FRP	Fleet Replacement Pilot
PPC	Patrol Plane Commander
PPP	Second Pilot
PPCP	Third Pilot
PPTC	Tactical Coordinator
PPNC	Navigator/Communicator
FE	Flight Engineer
SS1	Sensor Station One (Acoustic)
SS2	Sensor Station Two (Acoustic)
SS3	Sensor Station Three (Non-Acoustic)
IFT	Inflight Technician
EER	Extended Echo Ranging
CATM	Captive Air Training Missile
EMATT	Expendable Mobile ASW Training Target
TACNUC	Tactical Nucleus Crew
TPC	Tactical Proficiency Course

GENERAL

A. The P-3C Training Matrix reflects training and readiness events required for a single crew.

B. Tactical qualification events specifying 4 or more required positions may be conducted with 1 of those crew positions filled by an individual from outside the crew. All required crew positions must be filled.

C. Maximum of two qualifications may be awarded per event except for events conducting the INT-2. For events including the INT-2, up to three qualifications are allowed. Intent to conduct qualifications must be declared prior to the event.

D. Bracketed () SIM events are prerequisite trainer events prior to conducting a qual event inflight. Bracketed [] event hours represent the additional flight hours required if event conducted independently

E. Squadrons shall report no higher than T-3 for ASU unless two forward firing weapons have been expended during the IDTC.

NOTES

1. Entry level training. Readiness points credited after completion of FRS syllabus and receipt of the appropriate documentation at the squadron. MOB-1 includes all basic quals completed at the FRS.

2. MOB-2 covers Instructor Dedicated Field Work (IDFW), Night DFW, and DFW requirements. (See Chapter 4 of P-3 Training and Readiness Manual)

3. Monthly currency flights are required to sustain syllabus training and long term readiness. Currency flights shall include DFW, NDFW, and IPDFW in order to provide pilots with sufficient practice in ditching, emergency descent, formation, high angle-of-bank maneuvering, etc., as well as instrument and landing/pattern work. A DFW should include a minimum of 3 approaches and 6 landings. No points shall be allotted to any pilot not

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Figure 16. P-3C Training & Readness Matrix (continued)

holding a current instrument rating. When engaged in high tempo deployment operations, award readiness points in MOB-2/3/4, provided a DFW was completed the month prior.

4. In order for a crew to achieve Combat Ready status in Mobility, PPCs (including PPCs holding the PPP position) shall fly at least one IDFW every 90 days to practice engine out, no flap, Engine Failure Before/After Refusal (EFB/AR), and pattern work. IDFW events require an Instructor Pilot and, if applicable, an instructor flight engineer (IAW the Flight Instructor Guide). IDFW should include 6 landings, 3 approaches, a no-flap and a 3-engine or 2-engine landing.

5. For crew to hold any MOB-5 event points, all required crew members must be positionally NATOPS qualified. PPC and PPP must have a current instrument rating. Averages four flights per crew during IDTC.

6. Points awarded upon completion of syllabus and command designation for listed crew positions. Averages four flights per crew during IDTC.

7. TPC requires a minimum of 5 squadron-evaluated WST's utilizing ASW-1, ASW-2, ASW-3, or ASU-1 scenarios followed by Wing-evaluated ASW-1, ASW-2, ASW-3, and ASU-1 pre-quals.

8. C2W-1/INT-1/INT-3: PMA points are awarded as per "EQ" table below. Point system is dependent upon number of special use equipment utilized on each event (i.e., APS-137, EO, SEI, OTCIXS, AIMS, APG-66, ULQ-16, ALE-47, EP-2060, AVX-1, ALE-39, Pioneer, Photo-t, etc.)

Equipment PMA Points (EQ)

	0 SPECIAL MISSION EQUIPMENT USED	1 SPECIAL MISSION EQUIPMENT USED	2 SPECIAL MISSION EQUIPMENT USED	3+ SPECIAL MISSION EQUIPMENT USED
INT 1	10	13	16	20
INT 2	10	13	16	20
C2W 1	7	10	13	15

9. Graduated Point Quals for ASW-1 and ASW-2: PMA points are distributed in accordance with the "G" table below.

Qual	Q (0-30)	Q+1 (31-60)	Q+2 (61-90)	Q+3 (91-120)	Q+4 (>120)
ASW-1/2	20	15	10	5	0

10. Attackex qual must be preceded by a successful pre-qual in the WST.

11. Initial EER qual event cannot be attempted until crew is EER trained. EER training includes FSAO ground school, one WST and one training flight.

12. Squadrons are required to maintain a minimum of 2 BT crews.

Figure 17. P-3C Training & Readness Matrix Resource Summary

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P-3C Resource Summary

FLIGHT HOUR SUMMARY	To Achieve:			
(CREW/MONTH)	T-3	T-2	T-1	100%
TOTAL HOURS	22.1	26.0	30.9	35.8
TRAINING HOURS	17.3	20.3	24.1	27.9
TRANSIT HOURS	4.9	5.7	6.8	7.9
TOTAL SORTIES	3.5	4.1	4.9	5.7
(SQUADRON/YEAR)	T-3	T-2	T-1	100%
TOTAL HOURS	3186.4	3740.6	4448.7	5156.8
TRAINING HOURS	2484.0	2916.0	3468.0	4020.0
TRANSIT HOURS	702.4	824.6	980.7	1136.8
TOTAL SORTIES	509.0	597.5	710.7	823.8

SIMULATOR SUMMARY	To Achieve:			
(CREW/MONTH)	T-3	T-2	T-1	100%
2F87 OFT HOURS	3.3	3.3	3.3	3.3
2F87/2F140 WST HOURS	6.7	7.3	8.0	10.3
TOTAL HOURS	9.9	10.6	11.3	13.6
(SQUADRON/YEAR)	T-3	T-2	T-1	100%
2F87 OFT HOURS	468.0	468.0	468.0	468.0
2F87/2F140 WST HOURS	960.0	1056.0	1152.0	1488.0
TOTAL HOURS	1428.0	1524.0	1620.0	1956.0

ORDNANCE SUMMARY	To Achieve:			
(CREW/YEAR)	T-3	T-2	T-1	100%
SSQ-36 SONOBUOYS	17	25	33	45
SSQ-53 SONOBUOYS	285	416	576	720
SSQ-57 SONOBUOYS	14	18	22	102
SSQ-62 SONOBUOYS	80	115	135	135
SSQ-77 SONOBUOYS	68	94	154	170
SSQ-110 SONOBUOYS	0	0	60	60
JAU-22/B CAD	464	668	980	1232
MK-25 SMOKE	20	32	44	48
MK-58 SMOKE	10	16	20	28
MK-64/84 SUS	18	30	42	42
MK-39 EMATT	8	8	8	8
ATM-84 HARPOON (LIVE)	0	0	0	0
ATM-65 MAVERICK (LIVE)	0	0	0	0
ATM-84E SLAM (LIVE)	0	0	0	0
MK-46/50 TORPEDO (EX/REX)	0	1	1	1
MK-20/82, CBU99, BDU45	0	12	12	12

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Figure 17. P-3C Training & Readness Matrix Resource Summary (continued)

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NW20/33 CHAFF	30	30	30	30
L540 FLARE	30	30	30	30
MF-29 CAD	30	30	30	30
MF-60 CAD	30	30	30	30
BDU45/MK-36 MINE	0	0	4	4
MK-30 TARGET SLED	0	1	1	1
CATM-H SHAPE	0	1	1	1
CATM-M SHAPE	0	1	1	1
CATM-S SHAPE	0	0	0	1

NOTE: MK-30 and CATM's are re-usable.

(SQUADRON/YEAR)	**T-3**	**T-2**	**T-1**	**100%**
SSQ-36 SONOBUOYS	204	300	332	380
SSQ-53 SONOBUOYS	3420	4992	5632	6208
SSQ-57 SONOBUOYS	168	216	232	552
SSQ-62 SONOBUOYS	960	1380	1460	1460
SSQ-77 SONOBUOYS	816	1128	1368	1432
SSQ-110 SONOBUOYS	0	0	240	240
JAU-22/B CAD	5568	8016	9264	10272
MK-25 SMOKE	240	384	528	576
MK-58 SMOKE	120	192	240	336
MK-64/84 SUS	216	360	504	504
MK-39 EMATT	96	96	96	96
ATM-84 HARPOON (LIVE)	0	0	1	1
ATM-65 MAVERICK (LIVE)	0	0	1	1
ATM-84E SLAM (LIVE)	0	0	1	1
MK-46/50 TORPEDO (EX/REX)	0	12	12	12
MK-20/82, CBU99, BDU45	0	144	144	144
NW20/33 CHAFF	360	360	360	360
L540 FLARE	360	360	360	360
MF-29 CAD	360	360	360	360
MF-60 CAD	360	360	360	360
BDU45/MK-36 MINE	0	0	48	48
MK-30 TARGET SLED	0	12	12	12
CATM-H SHAPE	0	1	1	1
CATM-M SHAPE	0	1	1	1
CATM-S SHAPE	0	0	1	1

RANGE USAGE SUMMARY

(HOURS/CREW/YEAR)	**T-3**	To Achieve: **T-2**	**T-1**	**100%**
MINING RANGE	0.0	0.0	2.0	2.0
U/W INSTRUMENTED RANGE	0.0	3.0	3.0	3.0
WEAPONS RANGE	0.0	0.0	3.0	9.0

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Figure 17. P-3C Training & Readness Matrix Resource Summary (continued)

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(HOURS/SQUADRON/YEAR)		T-3	T-2	T-1	100%
MINING RANGE		0.0	0.0	24.0	24.0
U/W INSTRUMENTED RANGE		0.0	36.0	36.0	36.0
WEAPONS RANGE		0.0	0.0	36.0	108.0

SUPPORT/ADVERSARY SUMMARY N/A

T/M/S SPECIFIC VARIABLES

AVG HOURS/SORTIE	4.9
AVG EVENT HOURS/SORTIE	3.5
AVG TRANSIT TIME/SORTIE	1.4
CREWS/SQDN	12

To Achieve:

	T-3	T-2	T-1	100%
TOTAL MONTHLY SORTIES	3.5	4.1	4.9	5.7
TOTAL MONTHLY EVENT HOURS	17.3	20.3	24.1	27.9
MONTHLY TRANSIT TIME	4.9	5.7	6.8	7.9
TOTAL MONTHLY HOURS	**22.1**	**26.0**	**30.9**	**35.8**
TOTAL ANNUAL EVENT HOURS	207.0	243.0	289.0	335.0
TOTAL ANNUAL HOURS	**265.5**	**311.7**	**370.7**	**429.7**

ADDITIONAL HOURS/MONTH
OPS/SERVICES SUPPORT 12.0

NOTE: FLIGHT HOURS AND SONOBUOYS EXPENDED ON OPS, SERVICES AND SOME EXERCISES PROVIDE NO MATRIX READINESS PAYBACK. THESE REPRESENT MARGINAL RESOURCE REQUIREMENTS OVER AND ABOVE THOSE IDENTIFIED FOR TRAINING IN THIS MATRIX.

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Figure 18. P-3C Training & Readiness Matrix Event Descriptions

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P-3C Event Descriptions

Mobility

MOB 1 - FRS (NTA 4.9). This is an initial requirement for all aircrew prior to start of individual/crew training readiness process.

MOB 2 - PATROL PLANE COMMANDER CURRENCY (NTA 4.9.1). To practice pilot skills in the approach and landing phase of flight for PPC, as well as flying enough hours each month to maintain proficiency and build required experience levels. Additionally, complete a minimum of 3 approaches and 6 landings monthly.

MOB 3 - PATROL PLANE PILOT CURRENCY (NTA 4.9.1). To practice pilot skills in the approach and landing phase of flight for PPP, as well as flying enough hours each month to maintain proficiency and build required experience levels. Additionally, this event is used to train and qualify a PPP for designation as PPC, to ensure safe and efficient utilization of the P-3 weapons system in all phases of operation, and to train him/her to be a tactically competent member of the crew.

MOB 4 - PATROL PLANE CO-PILOT CURRENCY (NTA 4.9.1). To practice pilot skills in the approach and landing phase of flight for PPCP, as well as flying enough hours each month to maintain proficiency and build required experience levels. Additionally, this event is used to train and qualify a PPCP for designation as PPP, to ensure safe and efficient utilization of the P-3 weapons system in all phases of operation, and to train him/her to be a tactically competent crewmember.

MOB 5 - POSITIONAL NATOPS/INSTRUMENT CHECK (NTA 4.9.1). This event is used to periodically evaluate compliance with NATOPS/Instrument procedures by observing and grading individuals/units.

MOB 6 - PATROL PLANE INSTRUCTOR PILOT QUALIFICATION (NTA 4.9.1). This event is used to train and qualify a PPC for designation as Instructor Pilot(PPIP), to emphasize safety of flight, reinforce established procedures and recommended techniques, and to consolidate and standardize individual PQS training.

MOB 7 - AIRCREW PERSONNEL QUALIFICATION STANDARD (NTA 4.9.1). This event is used to train and qualify each aircrew for designation in respective positions, to ensure safe and efficient utilization of the P-3 weapons system in all phases of operation, and to train him/her to be a tactically competent member of the crew.

MOB 8 - TACTICAL PROFICIENCY COURSE (NTA 4.9.1). This event emphasizes crew coordination, tactical planning, proper use of tactics and tactical procedures and crew performance. TPC consists of five days of squadron classroom and WST instruction and Wing-evaluated WST's.

MOB 9 - FORMATION/INTERCEPT (NTA 4.9.1). This event is used to train and qualify each PPC to execute proper closure rate procedures in forming alongside (or in trail) of other aircraft.

Anti-Submarine Warfare

ASW 1 - ANTI-SUBMARINE WARFARE DIESEL AND/OR LITTORAL WATER (NTA 1.2.7, 1.5.4, 5.7). To evaluate a crew's ability to employ the P-3 weapons system to effectively conduct an all sensor search of an assigned area to detect, localize, track and attack a diesel submarine.

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Figure 18. P-3C Training & Readness Matrix Event Descriptions (continued)

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ASW 2 - ANTI-SUBMARINE WARFARE NUCLEAR AND/OR OPEN OCEAN (NTA 1.2.7, 1.5.4, 5.7). To evaluate a crew's ability to employ the P-3 weapons system to effectively conduct an all sensor search of an assigned area to detect, localize, track and attack a nuclear submarine.

ASW 3 - ANTI-SUBMARINE WARFARE JOINT CO-ORDINATION EXERCISE (NTA 1.2.7, 1.2, 1.2.1, 1.5.4, 3.2.8.1, 5.1.1). To evaluate a crew's ability to employ the P-3 weapons system to effectively conduct coordinated ASW search, localization and attack, in conjunction with other surface, subsurface and/or air units.

ASW 4 - ANTI-SUBMARINE WARFARE ATTACK EXERCISE (NTA 3.2.1.2). To evaluate a crew's ability to effectively employ the P-3 weapons system to passively track and then conduct multiple attacks on a submarine using MK-46/MK-50 torpedoes.

ASW 5 - ANTI-SUBMARINE WARFARE ATTACK EXTENDED ECHO RANGING (NTA 1.5.4). To evaluate a crew's ability to effectively employ the P-3 weapons system using EER software and tactics to detect and localize a submarine to a small AOP.

ASW 6 - ANTI-SUBMARINE WARFARE BEARTRAP (NTA 1.5.4, 2.2.1, 5.7). To evaluate a crew's ability to effectively utilize the Project Beartrap P-3 weapons system to localize, track, and collect SPL data on a submarine.

Anti-Surface Warfare

ASU 1 - ANTI-SURFACE WARFARE JOINT CO-ORDINATION EXERCISE (NTA 1.5.2, 1.4.4, 1.4.5, 3.2.8.1, 5.1.1). To evaluate a crew's ability to employ the P-3 weapons system to effectively conduct OTH-Targeting in conjunction with dissimilar OTH strike platforms.

ASU 2 - ANTI-SURFACE WARFARE BOMBING EXERCISE (NTA 3.2.1). To evaluate a crew's ability to accurately deliver bombs against surfaced or broached submarines.

ASU 3 - ANTI-SURFACE WARFARE HARPOON MISSILE EXERCISE (NTA 3.2.1.1). To evaluate a crew's ability to accurately target and deliver a Harpoon missile against surface targets.

ASU 4 - ANTI-SURFACE WARFARE MAVERICK MISSILE EXERCISE (NTA 3.2.1.1). To evaluate a crew's ability to accurately target and deliver a Maverick missile against surface targets.

ASU 5 - ANTI-SURFACE WARFARE STAND-OFF LAND ATTACK MISSILE EXERCISE (NTA 3.2.2). To evaluate a crew's ability to accurately target and deliver a SLAM missile against land targets.

Intelligence

INT 1 - MARITIME SURVEILLANCE (NTA 1.4.5, 1.4.7, 2.2.1, 2.2.3). To evaluate a crew's ability to effectively employ the P-3 sensor systems to conduct independent surface surveillance missions.

INT 2 - DATA COLLECTION (NTA 2.5). To evaluate a crew's ability to effectively collect, record and/or disseminate intelligence data.

INT 3 - BATTLE GROUP/LITTORAL SURVEILLANCE (NTA 1.5.8, 2.2.1, 2.3, 2.4). To evaluate a crew's ability to effectively employ the P-3 sensor systems to conduct surface surveillance missions overland or overwater during independent or coordinated operations.

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Figure 18. P-3C Training & Readness Matrix Event Descriptions (continued)

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Command and Control Warfare

C2W 1 - NON-ACOUSTIC SURVIVABILITY (NTA 2.2.1, 5.1.1, 5.5.4). To evaluate a crew's ability to effectively employ the P-3 non-acoustic sensor search of an assigned area to detect, localize and track a surface target, and effectively employ its survivability system to jam fire control and/or tracking radars.

Mine Warfare

MIW 1 - MINING EXERCISE (NTA 1.4.1). To evaluate a crew's ability to effectively employ the P-3 weapons systems for aerial mine laying.

Enclosure (14)

Figure 19. P-3C On-station Effectiveness (OSE) Summary Sheet

COMPATWINGSLANT/COMPATWINGSPACINST 3500.26E
15 January 1999

OSE SUMMARY SHEET

SQDN _____ Crew _____ Date _________ Event _________

MC _____________ PPC/PPTC _____________ PPP _____________

PPNC _____________ SS1 _____________ SS2 _____________

SS3 _____________ Flight Type _________ Buno________

Flt Hrs _____ ONSTA Hrs _____ CK ____ Mode IV Sweet/Sour

Link ATT ____ SUCC ____ TOFF Time ± _____
(Explain > ± 15 mins)

Quals ___________________ Final OSE Grade _____

Individual OSE Scores:

	Individual Score	Weighting	Weighted Score
MC	________	X .45	________
NAVCOMM	________	X .15	________
SS1/2	________	X .20	________
SS3	________	X .20	________

OSE Average ____

Crew Performance Points (ASW missions):

0 ATTACKS	1 ATTACK	2 ATTACKS	3 ATTACKS	OFFSTA CTC DP	OFFSTA CTC CPA/ACTIVE
0	10	15	20	5	10

Total ASW Crew Performance Pts ____

Final OSE Grade:

ASW Missions: (OSE Avg X .7) ____ + Crew Perf Points ____ = ____

All other missions: OSE Avg = ____

Comments: ____

________________________ Mission Commander

________________________ Debriefing Officer

Figure 20. P-3C Mission commnader OSE Post Flight Evaluation Sheet

COMPATWINGSLANT/COMPATWINGSPACINST 3500.26E
15 January 1999

MISSION COMMANDER OSE

POST-FLIGHT EVALUATION SHEET

SQDN _____ Crew _____ Date ________ Event ________

MC ______________ PPC ______________ PPTC ______________

Scores relate to: No Discrepancies/Minor Discrepancies/ Significant Discrepancies/Unsatisfactory

1. Planning Procedures:

a. Did the crew adequately prepare for the mission by type (ASW/ASU/INT):

(1) Appropriate consideration of brief (i.e. intelligence, OPTASK)........................20/15/10/0

(2) Accurate consideration of environmentals (i.e. ASRAPS, ICAPS).........................15/11/8/0

(3) Preflight calculations (i.e. FOM, range estimates, buoy depth selection)..............15/11/8/0

b. All mission required equipment operational at takeoff:

(1) Acoustic.......................................15/11/8/0

(2) Non-acoustic...................................15/11/8/0

(3) Navigation/Communications...................20/15/10/0

Awarded _______/Available = Subtotal _______/100

2. Passive Acoustic Sensor Utilization/Procedures:

a. Search:

(1) BT/AN data obtained and utilized.............NA/5/4/3/0

(2) Pattern deployed in a timely fashion.........NA/5/4/3/0

(3) Sensor setup and buoy monitor (POD maximized, pattern integrity)................NA/5/4/3/0

(4) TOI correctly recognized and classified.....NA/10/8/5/0

Figure 20. P-3C Mission commnader OSE Post Flight Evaluation Sheet (continued)

COMPATWINGSLANT/COMPATWINGSPACINST 3500.26E
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b. Transition/localization (contact gain through 2 NM fix):

(1) Use of appropriate tactics (buoy placement/geometry)........................NA/10/8/5/0

(2) Data evaluation (TMA).......................NA/10/8/5/0

c. Tracking (2 NM fix to first attack):

(1) Use of appropriate tracking tactics........NA/10/8/5/0

(2) Data evaluation (TMA):

(a) MDR calculation.........................NA/3/2/1/0

(b) CPA/F_0 determination...................NA/3/2/1/0

(c) Target fixing..........................NA/3/2/1/0

(d) Course estimate.........................NA/3/2/1/0

(e) Speed estimate (doppler and mech)...... NA/3/2/1/0

d. Management of available sensors..................NA/5/4/3/0

e. Plot stab maintained throughout search, localization tracking and attack phases..........NA/10/8/5/0

f. Precision tactical flying........................NA/5/4/3/0

Awarded_____/Available_____ = Subtotal_______/100

3. Active Acoustic/MAD Sensor Utilization/Procedures:

a. Active patterns:

(1) Initial active pattern:

(a) Appropriate type/spacing...............NA/10/8/5/0

(b) Timely placement.......................NA/10/8/5/0

(c) Effective sensor setup/monitor.........NA/10/8/5/0

(2) Integration of passive acoustic info.........NA/5/4/3/0

(3) Data evaluation and timely usage............NA/10/8/5/0

(4) Appropriate pattern expansion...............NA/10/8/5/0

(5) Plot stab..................................NA/10/8/5/0

Figure 20. P-3C Mission commnader OSE Post Flight Evaluation Sheet (continued)

COMPATWINGSLANT/COMPATWINGSPACINST 3500.26E
15 January 1999

b. MAD procedures:

(1) OFOM....................................NA/5/4/3/0

(2) Contact correctly recognized................NA/10/8/5/0

(2) Appropriate tactics.........................NA/10/8/5/0

c. Precision tactical flying.......................NA/10/8/5/0

Awarded____/Available____ = Subtotal_______/100

---

4. Lost Contact Procedures (if applicable):

a. Timely recognition of lost contact.............NA/40/30/20/0

b. Executed effective regain tactics:

(1) Datum marked................................NA/10/8/5/0

(2) Proper buoy pattern/procedures............NA/20/15/10/0

(2) Logical pattern geometry..................NA/20/15/10/0

c. Precision tactical flying.......................NA/10/8/5/0

Awarded____/Available____ = Subtotal_______/100

---

5. Radar/ESM/IRDS/EO Utilization/Procedures:

a. TOI correctly recognized and classified (ESM, ISAR or IRDS/EO)..............................NA/40/30/20/0

b. Effective Radar procedures/tactics.............NA/20/15/10/0

c. Effective ESM procedures/tactics...............NA/20/15/10/0

d. Effective IRDS procedures/tactics..............NA/20/15/10/0

Awarded____/Available____ = Subtotal_______/100

---

6. Turnover and Swap Procedures:

a. Onstation turnover:

(1) Proper altitude separation and EMCON........NA/15/-/-/0

(2) All turnover information properly obtained and evaluated (sensor data, target parameters, etc.).........................NA/15/11/8/0

Figure 20. P-3C Mission commnader OSE Post Flight Evaluation Sheet (continued)

COMPATWINGSLANT/COMPATWINGSPACINST 3500.26E
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(3) Prosecution assumed in a timely manner without losing contact.....................NA/15/11/8/0

b. Offstation swap:

(1) Proper altitude separation and EMCON........NA/15/-/-/0

(2) All turnover information properly passed via briefed procedure.....................NA/15/11/8/0

(3) Deployed turnover buoys correctly (proper channels, positions and timely).............NA/10/8/5/0

(4) Turnover to relief buoy in DP contact........NA/5/4/3/0

(5) Turnover to relief buoy CPA (<1000 yds).....NA/10/8/5/0

(6) Sent ASW summary and plain text via Link (if authorized).................................NA/5/-/-/0

Awarded_____/Available_____ = Subtotal________/100

7. Visual/Safety of Flight Procedures:

a. Visual/flight station awareness...................30/23/15/0

b. MOSA procedures....................................40/-/-/0

c. Standoffs/SOF......................................30/-/-/0

Awarded_____/Available_____ = Subtotal________/100

8. Attack procedures (ASW) (CKs allowed as required):

a. Initial attack criteria gained and recognized in a timely manner..............................NA/40/30/20/0

b. Execution of attacks:

(1) Timeliness.................................NA/10/8/5/0

(2) Aircraft placement (hdg relative to tgt)....NA/10/8/5/0

(3) Weapon mode................................NA/10/8/5/0

(4) Valid attack criteria......................NA/10/-/-/0

c. Weapon placement relative to target............NA/20/15/8/0

Awarded______/Available______ = Subtotal______/100

Figure 20. P-3C Mission commnader OSE Post Flight Evaluation Sheet (continued)

COMPATWINGSLANT/COMPATWINGSPACINST 3500.26E
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9. Attack Procedures (ASU):

a. Execution of attacks:

(1) Targeting procedures/timeliness...........NA/20/15/10/0

(2) Aircraft placement........................NA/15/11/8/0

(3) Proper launch mode........................NA/20/15/10/0

b. Appropriate BDA procedures executed............NA/15/11/8/0

c. Weapon launch envelope observed..................NA/15/-/-/0

d. Friendly and neutral shipping avoided............NA/15/-/-/0

Awarded_____/Available_____ = Subtotal_____/100

10. Communication Management Procedures:

a. Adherence to EMCON procedures.................NA/20/15/10/0

b. Contact/amplification/SITREP checkin/SURPIC reports....................................NA/20/15/10/0

c. Timeliness of reporting......................NA/20/15/10/0

d. Proper interpretation/execution of tasking........20/15/10/0

e. Proper data link utilization..................NA/20/15/10/0

Awarded_____/Available_____ = Subtotal_____/100

11. Intelligence/Surface Search Procedures:

a. Rigging procedures (altitude/CPA).............NA/40/30/20/0

b. ACINT/ELINT collection procedures.............NA/30/23/15/0

c. Photography....................................NA/30/23/15/0

Awarded_____/Available_____ = Subtotal_____/100

Figure 20. P-3C Mission commnader OSE Post Flight Evaluation Sheet (continued)

COMPATWINGSLANT/COMPATWINGSPACINST 3500.26E
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12. Crew Coordination:

a. ICS procedures....................................40/30/20/0

b. Tactical information flow.........................40/30/20/0

c. Software utilization..............................20/15/10/0

Awarded______/100

---

13. General Procedures:

a. Compliance with OPORDS, type commander instructions, SOPs, operational brief, etc........25/19/13/0

b. Did the crew meet the scheduled onstation time. (less than 15 minutes late).......................25/19/13/0

c. Sonobuoy management/restrictions/envelopes.........15/11/8/0

d. Crew NATOPS preflight complete. All special equipment and software available, utilized to complete mission.................................25/19/13/0

e. Quality of mission execution not covered specifically addressed in this grade sheet........25/19/13/0

Awarded _______/Available _____ = Subtotal ______/100

Figure 20. P-3C Mission commnader OSE Post Flight Evaluation Sheet (continued)

COMPATWINGSLANT/COMPATWINGSPACINST 3500.26E
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14. Summary:

	ASW	ASU	INT
a. Planning	___% X 5 = ___	___% X 10 = ___	___% X 10 = ___
b. Passive	___% X 10 = ___		
c. Active/MAD	___% X 10 = ___		
d. Lost cont	___% X 10 = ___		
e. RADAR/ESM/ IRDS/EO	___% X 5 = ___	___% X 20 = ___	___% X 10 = ___
f. Turnover/ SWAP	___% X 10 = ___		
g. VIS/SOF	___% X 10 = ___	___% X 10 = ___	___% X 10 = ___
h. Attack ASW	___% X 20 = ___		
i. Attack ASU		___% X 20 = ___	
j. COMM	___% X 5 = ___	___% X 5 = ___	___% X 20 = ___
k. INTEL	___% X 5 = ___	___% X 25 = ___	___% X 40 = ___
l. Crew coord	___% X 5 = ___	___% X 5 = ___	___% X 5 = ___
m. General	___% X 5 = ___	___% X 5 = ___	___% X 5 = ___
Total	___	___	___

Mission Commander Comments: ________________________________

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Mission Commander

Debriefing Officer Comments: ________________________________

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Debriefing Officer

Figure 21. P-3C Anit-submarine Warfae (ASW) T&R Evaluation

COMPATWINGSLANT/COMPATWINGSPACINST 3500.26E
15 January 1999

ASW-1
DIESEL/LITTORAL WATER

FXP: ASW-11-A

1. Mission Objective. To evaluate a crew's ability to employ the P-3 weapons system to effectively conduct an all sensor search of an assigned area to detect, localize, track and attack a diesel submarine on a simulated wartime patrol.

Note: The exercise shall COMEX with a planned search of the assigned area and cover all phases (search, localization and attack) of ASW. Scenarios shall be consistent with expected diesel patrol areas and tactics.

2. Requirements

a. The qualification will be attained in the aircraft.

b. Required crew members, per the Training Matrix, must score 85% OSE or better for qualification.

3. Measures of Performance

a. EMCON Restrictions: EMCON policy shall be briefed by the Mission Commander and followed throughout the on-station period.

b. Search Phase: An all-sensor search shall be planned and executed, minimizing the possibility of counter detection prior to gaining contact on the target.

c. Localization Phase: An aggressive localization will occur, to minimize time between initial contact and the first attack. Full use of all aircraft electronic sensors is expected.

d. Attack Phase: Multiple simulated attacks shall be conducted IAW NWP-3-22.5-P3 procedures. All required checklists shall be performed. An estimate of the submarine's course and speed shall be logged at the time of each attack.

e. Post-Attack Phase: Crew shall monitor torpedo operation, while maintaining close tracking (to retain attack criteria) and be prepared for immediate re-attack if the torpedo malfunctions.

4. Measure of Effectiveness. Crew successfully searched, localized, tracked and attacked a (simulated) diesel submarine in littoral waters.

5. Evaluation

a. Debriefing Officer

Figure 21. P-3C Anit-submarine Warfae (ASW) T&R Evaluation (continued)

COMPATWINGSLANT/COMPATWINGSPACINST 3500.26E
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(1) Reconstruct the exercise and evaluate crew OSE, complete all positional gradesheets, complete the evaluation sheet and assign a recommended grade (Qualified/ Unqualified).

(2) Critique performance and debrief crew members on the results of the evaluation.

(3) Forward all exercise data to the Wing Certifying Officer.

b. Wing Certifying Officer

(1) Review the evaluation and award the crew grade as appropriate.

(2) Forward all mission data to the Squadron TAB for review. and crew debrief.

c. Squadron TAB Officer

(1) Conduct TAB evaluation and thorough debriefing of the crew.

(2) Forward specific comments, analysis results and recommendations to Commanding Officer.

d. Commanding Officer. Commanding Officer shall review the evaluation.

2-26

Figure 22. P-3C ASW-1 Evaluation sheet

COMPATWINGSLANT/COMPATWINGSPACINST 3500.26E
15 January 1999

ASW-1
DIESEL/LITTORAL WATER

EVALUATION SHEET

SQDN _____ Crew _____ Date _______ Event _______ OSE _____

PPC ____________ PPTC ____________ SS1 ____________

SS3 ____________

Notes: Required crew members, per the Training Matrix, must score 85% OSE or better and 3 of 4 TACNUC members must be present for qualification.

A 'U' in any area or more than two Conditionally Qualified (CQ) marks will result in a grade of Unqualified.

1. Search: Initial planned area search.

a. Proper all sensor search tactics demonstrated. Q

b. Minor procedural errors, but search effectiveness and counter detection plan not compromised. CQ

c. Unsatisfactory search technique demonstrated. U

2. Localization: Initial contact to first CPA, visual or radar sinker. Localization phase should take less than 30 minutes.

a. Aggressive and timely acoustic and non-acoustic localization conducted. Target correctly classified. All aircraft systems utilized to fullest potential. Q

b. Minor discrepancies noted in procedures that did not affect overall localization success. CQ

c. Target not correctly classified or localized to within 2 NM, and/or within 30 minutes, following sufficient cueing data. U

3. Tracking: First CPA, visual or radar sinker to first valid attack. Tracking time shall be kept to the minimum required to achieve valid attack criteria.

Figure 22. P-3C ASW-1 Evaluation sheet (continued)

COMPATWINGSLANT/COMPATWINGSPACINST 3500.26E
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a.	All active and passive sensors utilized to maximum extent to achieve attack criteria on target in shortest viable time. Active patterns correctly employed, MAD fully utilized and available passive acoustic information utilized.	Q
b.	Minor errors in active pattern placement, expansion and data interpretation noted but successful attack conducted. Passive info available, but not used. Crew took extended period to gain attack criteria.	CQ
c.	Attack criteria not achieved.	U
4.	<u>Attack</u>	
a.	Minimum of two valid simulated attacks conducted.	Q
b.	Failed to achieve two valid simulated attacks.	U
5.	<u>Post-Attack/Re-attack</u>	
a.	Torpedo operation monitored by the crew, while close tracking was maintained (to retain attack criteria). The crew was prepared for immediate re-attack in case of torpedo malfunction. Proper pattern extensions and aircraft positioning completed.	Q
b.	Torpedo not monitored or crew not prepared for immediate re-attack.	U
6.	<u>Lost Contact Procedures</u> (if applicable)	
a.	Timely recognition of lost contact and proper tactics employed to regain.	Q
b.	Procedural errors in lost contact tactics noted, but target regained.	CQ
c.	Target not regained due to improper lost contact pattern deployment or timely lost contact recognition.	U
7.	<u>Swap Procedures</u> (if applicable)	
a.	Hot CPA/Active/MAD swap conducted with relief.	Q
b.	Hot DP/BB contact passed to relief.	CQ
c.	Cold Swap conducted with relief.	U

Figure 22. P-3C ASW-1 Evaluation sheet (continued)

COMPATWINGSLANT/COMPATWINGSPACINST 3500.26E
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8. Evaluation

Debriefing Officer comments: ______________________

A grade of Qualified/Unqualified is recommended.

Debriefing Officer/Date

Wing Certifying Officer:

A grade of Qualified/Unqualified is awarded.

Wing Certifying Officer/Date

Squadron TAB Officer comments: ______________________

Squadron TAB Officer/Date

Commanding Officer:

Participating required crew members have been debriefed and discrepancies reviewed.

Commanding Officer/Date

Appendix B

Appendix B contains a series of figures describing the training of the NSFS mission. We show the training matrix from [3], the live-fire FIREX overall evaluation form, and a sample of a specific NSFS exercise grade sheet.

Figure 23. Ship amphibious Warfare (AMW) Training Exercises

AMW EXERCISES-SHIPS

EXERCISES	AGF	AOE1	AOE6	ARS50	CG47	DD963	DDG51	FFG7	JCC	LCC	LHA	LHD	LPD4	LPD17	LSD36	LSD41	LST	MCM	MCS	MHC51
BASIC PHASE																				
AMW-1-SF NSFS REHEARSAL (NON-FIRE)[1]					X	X	X													
AMW-2-SF NSFS QUAL (FIREX I)[2]					X	X	X													
AMW-4-SF EMBARK PLAN										X	X	X	X		X	X	X			
AMW-5-SF ASSAULT BOAT HOIST/LOWER													X		X	X				
AMW-6-SF EMB/DBK L/C WELL DECK											X	X	X		X	X				
AMW-7-SF EMBARK/ DEBARK LCAC WELL DECK											S	S	S		S	S				
AMW-12-SF BASIC CARGO HANDLING											S	S	S			S	S			
AMW-16-SF WELL DECK CARGO HNDLG											S	S	S			S	S			
AMW-27-SF ASSAULT CRAFT HANDLING IN WELL DECK OPS											S	S	S		S	S				
AMW-28-SF CONTROL SHIP-SHORE MOVE (DAY)											S		S		S	S				
AMW-30-SF CONTROL SHIP-SHORE MOVE (NIGHT)											S		S		S	S				
AMW-34-SF EMBARK/ DEBARK AAV FROM WELL DECK[3]											S	S	S		S	S				
AMW-35-SF EMBARK/ DEBARK AAV FM LST																	S			
AMW-36-SF U/W LAUNCH AAV[4]											S	S	S			S	S			
AMW-37-SF CONTROL AAV SHIP-SHORE MOVEMENT[5]											S	S	S			S	S			
AMW-38-SF AAV SHIP-SHORE MOVE											S	S	S			S	S			
AMW-39-SF LCU STERNGATE MARRIAGE TO WELL DECK											S	S	S		S	S				

1 MUST BE ACCOMPLISHED WITHIN 90 DAYS PRECEDING FIREX I
2 MUST BE ACCOMPLISHED AS EARLY AS SCHEDULE PERMITS. LANT FLT SHIPS ACCOMPLISH DURING INTERMEDIATE PHASE
3 REQUIRED FOR LHA/LHD ONLY IF EMBARKATION OF AAV IS PLANNED
4 REQUIRED FOR LHA/LHD ONLY IF EMBARKATION OF AAV IS PLANNED
5 REQUIRED FOR LHA/LHD ONLY IF EMBARKATION OF AAV IS PLANNED

Figure 23. Ship amphibious Warfare (AMW) Training Exercises (continued)

COMNAVSURFLANT/PACINST 3502.2E

AMW EXERCISES - SHIPS

EXERCISES	AGF	AOE1	AOE6	ARS50	CG47	DD963	DDG51	FFG7	JCC	LCC	LHA	LHD	LPD4	LPD17	LSD36	LSD41	LST	MCM	MCS	MHC51
AMW-45-SF LST BEACHING AND EXTRACTION																	S			
AMW-46-SF RCV/HANDLE CASUALTIES WELL/ TANK DECK											S	S	S		S	S	S			
AMW-47-SF ASSAULT IN CBR ENVIRONMENT											S	S	S		S	S				
AMW-48-SF AMPHIB FINAL EVALUATION PERIOD											S	S	S		S	S				
AMW-61-SF CNTRL LCAC SHIP-SHORE MOVEMENT											S	S	S		S	S				
AMW-69-SF AMPHIB ENVIRON SUPPORT										X	S	S	S							
AMW-6-I HELO LAUNCH/RECOVERY (EMCON)										X	X	X	X		X	X	X			
AMW-7-I INSTRUMENT APPROACH A/C RECOVERY											X	X	X		X	X				
AMW-8-I HELO TROOP EMBARK/DEBARK											S	S	S		S	S	S			
AMW-9-I HELO LOAD/ UNLOAD											S	S	S		S	S	S			
AMW-12-I COMBAT FLIGHT OPS											S	S	S		S	S				
AMW-13-I COMBAT FLIGHT OPS (EMCON)											S	S	S		S	S				
AMW-14-I CONTROL HELO CIC/HDC											S	S	S							
AMW-15-I CONTROL HELO (EMCON)											S	S	S							
AMW-16-I RECEIVE/HANDLE CASUALTIES FROM HELO											S	S	S		S	S	S			
AMW-21-I AVIATION ORDNANCE STRIKE UP											S	S	S							
AMW-22-I HELO NVD OPS[6]											S	S	S		S	S				
INTERMEDIATE PHASE																				
AMW-1-SF NSFS REHEARSAL (NON-FIRE)[7]					X	X	X													
AMW-2-SF NSFS QUAL (FIREX I)[8]					X	X	X													
ADVANCED PHASE																				

6 NVG CERTIFIED SHIPS ONLY
7 PACFLT SHIPS CONDUCT IN BASIC PHASE
8 PACFLT SHIPS CONDUCT IN BASIC PHASE

Figure 23. Ship amphibious Warfare (AMW) Training Exercises (continued)

COMNAVSURFLANT/PACINST 3502.2E

AMW EXERCISES-SHIPS

EXERCISES	**AGF**	**AOE1**	**AOE6**	**ARS50**	**CG47**	**DD963**	**DDG51**	**FFG7**	**JCC**	**LCC**	**LHA**	**LHD**	**LPD4**	**LPD17**	**LSD36**	**LSD41**	**LST**	**MCM**	**MCS**	**MHC51**
AMW-7-SF EMBARK/ DEBARK LCAC WELL DECK											X	X	X		X	X				
AMW-51-SF MAJ PHIBLEX											X	X	X		X	X	X			
AMW-61-SF CONTROL LCAC SHIP-SHORE MOVEMENT											X	X	X		X	X				
AMW-70-SF LAUNCH/ RECOVERY OF CRRC													X		X	X	X			
AMW-71-SF RRC/CRRC RAID PLAN													X		X	X				
AMW-1-I VERTICAL ENVELOPMENT											X	X	X							
AMW-19-I AIR INTERCEPT CONTROL											X	X								
AMW-20-I CONTROL ASSAULT A/C TACC/HDC											X	X	X							
AMW-22-I HELO NVD OPS[9]											X	X	X		X	X				
AMW-23-I EMERGENCY DEFENSE OF THE ATF											X	X	X							
AMW-24-I AV PHIBEX											X	X	X							
REPETITIVE PHASE																				
AMW-1-SF(12,18,24) NSFS REHEARSAL					X	X	X													
AMW-3-SF (12,18, 24) NSFS QUAL MAINTENANCE (FIREX II)					X	X	X													
AMW-4-SF (6,9,12) EMBARK PLANNING											X	X	X		X	X	X			
AMW-5-SF (6,9,12) ASSAULT BOAT HOIST AND LOWERING													X		X	X				
AMW-6-SF (6,9,12) EMBARK/DEBARK LANDING CRAFT -WELL DECK											X	X	X		X	X				
AMW-7-SF (6,9,12) EMBARK/DEBARK LCAC WELL DECK											X	X	X		X	X				
AMW-13-SF (6,9,12) BASIC WELL DECK CARGO HANDLING											X	X	X		X	X				

[9] NVG CERTIFIED SHIPS ONLY

Figure 23. Ship amphibious Warfare (AMW) Training Exercises (continued)

COMNAVSURFLANT/PACINST 3502.2E

AMW EXERCISES - SHIPS

EXERCISES	AGF	AOE1	AOE6	ARS50	CG47	DD963	DDG51	FFG7	JCC	LCC	LHA	LHD	LPD4	LPD17	LSD36	LSD41	LST	MCM	MCS	MHC51
AMW-27-SF (6,9,12) ASSAULT CRAFT HANDLING IN WELL DECK OPS											X	X	X		X	X				
AMW-34-SF (6,9,12) EMBARK/DEBARK AAV FROM WELL DECK[10]											X	X	X		X	X				
AMW-35-SF (6,9,12) EMBARK/DEBARK AAV FROM LST																	X			
AMW-36-SF (6,9,12) U/W LAUNCH AAV[11]											X	X	X		X	X	X			
AMW-37-SF (6,9,12) CONTROL AAV SHIP-SHORE MOVEMENT[12]											X	X	X		X	X	X			
AMW-46-SF (6,9,12) RECEIVE/HANDLE CASUALTIES WELL/ TANK DECK											X	X	X		X	X	X			
AMW-61-SF (6,9,12) CONTROL LCAC SHIP-SHORE MOVEMENT											X	X	X		X	X				
AMW-69-SF (12,12, 12) AMPHIB ENVIRONMENTAL SUPP										X	X	X	X							
AMW-6-I (3,6,9) HELO LAUNCH/ RECOVERY (EMCON)										X	X	X	X		X	X	X			
AMW-7-I (3,6,9) INSTRUMENT APPROACH A/C RECOVERY											X	X	X		X	X				
AMW-12-I (6,9,12) COMBAT FLIGHT OPS											X	X	X		X	X				
AMW-14-I (6,9,12) CONTROL HELO CIC/HDC											X	X	X							
AMW-16-I (6,9,12) RECEIVE/HANDLE CASUALTIES FROM HELO											X	X	X		X	X	X			
AMW-19-I (3,6,9) AIC											X	X								
AMW-22-I (6,9,12) HELO NVD OPS[13]											X	X	X		X	X				

[10] REQUIRED FOR LHA/LHD ONLY IF EMBARKATION OF AAV IS PLANNED
[11] REQUIRED FOR LHA/LHD ONLY IF EMBARKATION OF AAV IS PLANNED
[12] REQUIRED FOR LHA/LHD ONLY IF EMBARKATION OF AAV IS PLANNED
[13] NVG CERTIFIED SHIPS ONLY

Figure 23. Ship amphibious Warfare (AMW) Training Exercises (continued)

COMNAVSURFLANT/PACINST 3502.2E

AW EXERCISES-SHIPS

EXERCISES	**AGF**	**AOE1**	**AOE6**	**ARS50**	**CG47**	**DD963**	**DDG51**	**FFG7**	**JCC**	**LCC**	**LHA**	**LHD**	**LPD4**	**LPD17**	**LSD36**	**LSD41**	**LST**	**MCM**	**MCS**	**MHC51**
BASIC PHASE																				
AAW-2-SF LINK 11 OPS					X	X	X	X		X	X	X							X	
AAW-3-SF RADAR IFF TRACKING	X	X	X		X	X	X	X		X	X	X	X		X	X			X	
AAW-4-SF AA TGT DESIGNATION AND ACQUISITION (NON-FIRING)		X	X		X	X	X	X		X	X	X								
AAW-6-SF S/S AIR TARGET DETECTION, TRACK, DESIG & ACQ		X	X		X	X	X	X			X	X								
AAW-7-SF TACTICAL AAW		X	X		X	X	X	X			X	X								
AAW-10-SF ASMD (N/F)[1]		X	X		X	X	X	X			X	X								
AAW-11-SF SUBSONIC ASMD STREAM RAID(FIRING)[2]		X	X		X	X	X	X			X	X				X				
AAW-12-SF AA GUNNERY[3]					X	X	X	X												
AAW-15-SF INFO PROCEDURES					X	X	X	X		X	X	X								
AAW-17-SF LINK 11 INTRUSION-JAMMING					X	X	X	X		X	X	X								
AAW-20-SF CIWS READINESS EVAL[4]	X	X	X		X	X	X	X	X	X	X	X	X		X	X	X		X	
AAW-21-SF CIWS FIRING	X	X	X		X	X	X	X	X	X	X	X	X		X	X	X		X	
AAW-24-SF DTE SEQUENCE (NON -FIRING)		X	X		X	X	X	X			X	X								
AAW-26-SF LINK 4A AIC					X		X				X	X								
AAW-3-I AIC[5]					X	X	X	X			X	X								
AAW-4-I LOST PLANE HOMING	X	X	X		X	X	X	X	X	X	X	X	X						X	
AAW-5-I AA TGT DESIG/ACQ IN A MUL TGT ENV-CAP COORD					X	X	X	X			X	X								
AAW-6-I ECCM MECH JAMMING[6]		X	X		X	X	X	X	X	X	X	X	X		X	X			X	

1 SELECTED RUNS SHOULD INCLUDE AT LEAST 1 LOW FLYER (200 FT OR LESS)
2 LANTFLT SHIPS CONDUCT DURING INTERMEDIATE PHASE. LHA AND LSD-41 CLASS SHIPS EQUIPPED WITH SSDS/RAM
3 LANTFLT SHIPS CONDUCT DURING INTERMEDIATE PHASE
4 FOR BASIC PHASE SUCCESSFUL CSSQT FIRING(S) AND SYSTEM CERTIFICATION SATISFIES THIS REQUIREMENT.
5 CONDUCT ONE PER CONTROLLER. NOT APPLICALBE TO FFG-7R
6 ACCOMPLISH IN TSTA I OR II WITH OBT OR AS SERVICES PERMIT

Figure 24. Ship NSFS AMW-2 (FIREX I) Evaluation Worksheet

FIREX I EVALUATION WORKSHEET

DEMONSTRATION ELEMENTS:

Check Fire _____	Reduced Charge _____
Fuze Time _____	Full Salvo _____

MISSION	RAW GRADE	PERCENT SCORE (Minimum 60 Percent)
Scheduled Target	_____/45	_____
Beach Neutralization	_____/70	_____
Grid	_____/65	_____
Polar	_____/65	_____
Shift From Known Point	_____/65	_____
Refire	_____/50	_____
Fresh Target	_____/65	_____
Countermechanized	_____/75	_____
Counterbattery	_____/100	_____
Suppression of Enemy Air Defense	_____/65	_____
Continuous Illumination	_____/125	_____
Communications Bonus Points (*50 Maximum*)	_____	
Penalty Points (*System problems/delays/failed exercise*)	_____	
TOTAL	_____/790	_____

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Figure AMW-2-SF-10. (U) FIREX I Evaluation Worksheet

Figure 25. Ship NSFS AMW-3 (FIREX II) Evaluation Worksheet

FIREX II EVALUATION WORKSHEET

DEMONSTRATION ELEMENTS:

Check Fire _____ Reduced Charge _____

Fuze Time _____ Full Salvo _____

MISSION	RAW GRADE	PERCENT SCORE *(Minimum 60 Percent)*
Call Fire	_____/65	_____
Refire	_____/50	_____
Countermechanized	_____/75	_____
Counterbattery	_____/100	_____
Suppression of Enemy Air Defense	_____/65	_____
Continuous Illumination	_____/125	_____
Communications Bonus Points *(30 Maximum)*	_____	
Penalty Points *(System problems/delays/failed exercise)*	_____	
TOTAL *(Minimum 70 Percent)*	_____/480	_____

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Figure AMW-3-SF-1. (U) FIREX II Evaluation Worksheet

Figure 26. NFFS Exercise Grade Sheet (scheduled target)

SCHEDULED TARGET

USS ______________________ DATE ______

RNG TGT NO [ ]   OTL MILS GRID [ ]   MISSION NO [ ]   GUN RANGE [ ]

GTL MILS GRID [ ]

"RDY", TOF ____________   TIME "FIRE TO SHOT" ____________

ISE MTRS [ ]

≤ 100 MTRS = 15
≤ 200 MTRS = 10
≤ 300 MTRS = 5
≤ 400 MTRS = 3
> 400 MTRS = 0

________ /15

CORRECTIONS

DEF.	RANGE	ELEV	DEF	RANGE	ELEV

SPOTS TO ADJUST TO HIT [ ]

SPOT 1 = 15
SPOT 2 = 10
SPOT 3 = 5

________ /15

FFE ROUNDS [ ]   HIT < 50 MTRS OF TARGET

3 HITS = 15
2 HITS = 12
1 HIT = 10

________ /15

SUBTOTAL ________

CPE	BPE

COMMENTS
____
____
____
____
____

LESS CPE/BPE ________

SPOTTER ____________________

FINAL SCORE [ ] /45

PASS > 27

UNCLASSIFIED

Figure AMW-2-SF-2. (U) NSFS Exercise Grade Sheet (Scheduled Target)

Appendix C

Appendix C contains a series of figures showing:

- The F/A-18 T&R matrix and event descriptions
- A sample of the SHARP data we collected.

Figure 27. F/A-18 Training & Readiness Matrix

F/A-18 Training Readiness Matrix

CORE MISSIONS

"T" LEVEL	T&R EVENT	EVENT TITLE	MEDIA #1 F	MEDIA #1 S	PERIODICITY #2 L1	L2	L3	L4	PMA POINTS MOB	STW	AAW	AMW	ASU	MIW	CCC	ORD	SUPPORT	NOTES
4	MOB 06	NATOPS		1.0	365	365	365	365	10						10			
4	MOB 05	INST Check		1.0	365	365	365	365	10						10			
4	STW 10	STWSIM		3.0	62	62	92	92		1			3					Evts STW13,14,19,20,21,22;ASU3
4	AAW 09	AAWSIM		3.0	62	62	92	120			2							Evts AAW10,12,13,16
4	MIW 01	Mining SIM		1.0	548	548	Ta	Ta						35				*1
4	STW 05	TGT ACQ	1.0		62	62	120	120		2							TF	
4	STW 07	TGT ATTACK	2.0		62	62	92	120		2						Inert	Target	
4	STW 04	STK-2(4)	2.0		31	46	62	62		4						Inert,C-9	Target	
4	AAW 06	BFM-H	1.0		62	62	92	92			4					C-9		
4	AAW 05	BFM-O	1.0		62	62	92	92			3					C-9		
4	AAW 04	BFM-D	1.0		62	62	92	92			3					C-9		
T-4/T-3 TRANSITION																		
3	AAW 03	D/OCA-2	1.0		31	46	62	62			4				3	C-9	Bx4	
3	AAW 08	TACINT	3.0		31	46	62	62			1					C-9		Validated by add'l AAW1,2 or 3. *2
3	STW 02	STK-4(2)se	2.0		62	92	120	120		6					3	Inert,C-9	Bx4, Target	Flown as (2), reduce pts to 4/1/3.
3	AMW 01	CAS-d	1.0		62	62	92	92				25			5	Inert	Target, FAC	
3	MOB 04	AirNav/Inst	2.0		92	92	92	92	10									
3	STW 09	HARM	0.5	0.5	92	92	120	120		2			7			C-HARM		Flown in sim, reduce pts to 2/6. *1
3	MOB 01	FCLP	1.0		na	na	na	na	10									*3, #4
3	MOB 02	CQSIM		1.0	na	na	na	na	10									*3, #4
3	MOB 03	CQ	1.0		na	na	na	na	20									Satisfies FCLP & CQSIM, *3, #4
3	STW 08	LATT	0.5	0.5	180	180	180	180		2							LAT Range	*1
T-3/T-2 TRANSITION																		
2	STW 03	STK-4(2)	1.0		31	46	62	62		4						Inert,C-9	Target	Flown as (2), reduce pts to 3.
2	AAW 01	OCA-4(2)	2.0		62	92	120	120			5				5	C-9	Bx4	Flown as (2), reduce pts to 4/2.
2	AAW 02	DCA-4(2)	2.0		62	92	120	120			5				5	C-9	Bx4	Flown as (2), reduce pts to 4/2.
2	STW 01	STK-4(2)n	2.0		62	62	92	92		4						Inert,C-9	Target	Flown as (2), reduce pts to 3.
T-2/T-1 TRANSITION																		
1	AMW 02	CAS-n	1.0		62	62	92	92				10			5	Inert	Target, FAC	
1	AAW 07	A/A GUN	1.0		360	360	540	540			1					250 rds		
1	ASU 01	WASEX	1.0		180	180	270	270					16		6		Surface Target	
1	STW 06	CSAR	1.0		120	120	180	180		3		2			4	Inert		
1	MIW 02	Coord MINEX	1.0		360	548	Ta	Ta						10	5	Inert	Mining Range	

Figure 27. F/A-18 Training & Readiness Matrix (continued)

F/A-18 Training Readiness Matrix

MISSIONS																	
T&R EVENT	EVENT TITLE	MEDIA #1 F	MEDIA #1 S	PERIODICITY #2 L1	L2	L3	L4	PMA POINTS MOB	STW	AAW	AMW	ASU	MIW	CCC	ORD	SUPPORT	NOTES
AAW 01	OCA-4(2)	2.0		62	92	120	120			5				5	C-9	Bx4	Flown as (2), reduce pts to 4/3.
AAW 02	DCA-4(2)			62	92	120	120			5				5	C-9	Bx4	Flown as (2), reduce pts to 4/3.
AAW 03	D/OCA-2/(4)	1.0		31	46	62	62			4				3	C-9	Bx2	
AAW 04	BFM-D	1.0		62	62	92	92			3					C-9		
AAW 05	BFM-O	1.0		62	62	92	92			3					C-9		
AAW 06	BFM-H	1.0		62	62	92	92			4					C-9		
AAW 07	A/A GUN	1.0		360	360	540	540			1					250 rds		
AAW 08	TACINT	3.0		31	46	62	62			1					C-9		Validated by add'l AAW1,2 or 3. *2
AAW 09	AAWSIM		3.0	62	62	92	120			2						WTT/TOFT	Evts AAW10,12,13,16
STW 01	STK-4(2)n	2.0		62	92	120	120		4						Inert,C-9	Tactical Target	Flown as (2), reduce pts to 3.
STW 02	STK-4(2)se	2.0		62	92	120	120		6	2				3	Inert,C-9	Bx4, Tactical Target	Flown as (2), reduce pts to 4/1/3.
STW 03	STK-4(2)	1.0		31	46	62	62		4						Inert,C-9	Target	Flown as (2), reduce pts to 3.
STW 04	STK-2(4)	2.0		31	46	62	62		4						Inert,C-9	Target	
STW 05	TGT ACQ	1.0		62	62	120	120		2							Tactical Target/TF	
STW 06	CSAR	1.0		120	120	180	180		3		2			4	Inert		
STW 07	TGT ATTACK	2.0		62	62	92	120		2						Inert	Target	
STW 08	LATT	0.5	0.5	180	180	180	180		2							LAT Range/WTT/TOFT	*1
STW 09	HARM	0.5	0.5	-92	92	120	120		2			7			C-HARM	WTT/TOFT	Flown in sim, reduce pts to 2/6. *1
STW 10	STWSIM		3.0	62	62	92	120		1			3				WTT/TOFT	Evts STW13,14,19,20,21,22;ASU3
MIW 01	Mining		1.0	548	548	Ta	Ta						35			WTT/TOFT	*1
MIW 02	Coord MINEX	1.0		360	548	Ca	Ca						10	5	Inert	Mining Range	
AMW 01	CAS-d	1.0		62	62	92	92				25			5	Inert	Target, FAC	
AMW 02	CAS-n	1.0		62	62	92	92				10			5	Inert	Target, FAC	
ASU 01	WASEX	1.0		180	180	270	270					16		5		Surface Target	
MOB 01	FCLP	*3		na	na	na	na	10									#3
MOB 02	CQSIM		*3	na	na	na	na	10								OFT/TOFT	#3
MOB 03	CQ	*3		na	na	na	na	20									#3
MOB 04	AirNav/Inst	2.0		92	92	92	92	10									
MOB 05	INST Check		1.0	365	365	365	365	10						10		OFT/TOFT	
MOB 06	NATOPS		1.0	365	365	365	365	10						10		OFT/TOFT	

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F/A-18 Training Readiness Matrix

ACTIONS		MEDIA #1		PERIODICITY #2				PMA POINTS									
T&R EVENT	EVENT TITLE	F	S	L1	L2	L3	L4	MOB	STW	AAW	AMW	ASU	MIW	CCC	ORD	SUPPORT	NOTES
AAW 20	HiFast Int	0.7	0.3	92	92	120	120			2					C-9	B/WTT/TOFT	Flown in sim, reduce pts to 1. *1
AAW 21	2vsX Maneuv	1.0		62	62	92	92			2					C-9	Bx2	
AAW 22	EP	0.5	0.5	62	62	92	92			2						Jammer/WTT/TOFT	*1
AAW 23	ScreenTgt	0.5	0.5	62	62	92	92			2					C-9	Jammer, B/WTT/TOFT	*1
AAW 24	Night AAW	1.0		31	46	62	62			3							
AAW 25	VID	1.0		31	31	62	62			2							
AAW 26	MSI	1.0	2.0	45	62	62	62			2						WTT/TOFT	*1
AAW 27	Chaff [Exp]	4.0		62	62	92	92		1	1	1				15 Chaff		
AAW 28	Flares [Exp]	4.0		62	62	92	92		1	1	1				10 Flares		
AAW 29	Rdr Msl [Exp]	1.0		Career						3					RDR Msl	Target, Range	
AAW 30	AIM-9 [Exp]	1.0		Career						2					IR Msl	Target, Range	
STW 20	NVD LoLvl	1.0		62	62	92	92		2							NVG, Route	
STW 21	Day LoLvl	1.0		62	62	92	120		1							Route	
STW 22	LST	0.5	0.5	120	120	180	180		2		2				Inert	LST/WTT/TOFT	*1
STW 23	S/A Threat	0.5	0.5	62	62	92	92		2	2	2					WTT/TOFT	*1
STW 24	Strafe	1.0		62	62	62	62		1		4				250 rds	Target	
STW 25	Paraflare	1.0		270	270	365	365		1		3				Inert, Para	Target	
STW 26	PGM [Exp]	1.0		1095	1095	1095	1095		3						WE, Mav	Tactical Target	Ord=WE,Mav,SLAM, or JSOW
STW 27	LGTR [Exp]	1.0		31	46	62	62		3						LTF, Lgtr	Laser Tactical Target	
STW 28	L-Maverick [Pro]	0.5	0.5	92	92	120	120		1			8			C-LMav	Sim Target/WTT/TOFT	*1
STW 29	I-Maverick [Pro]	0.5	0.5	92	92	120	120		1			8			C-IMav	Sim Target/WTT/TOFT	*1
STW 30	Walleye [Pro]	0.5	0.5	92	92	120	120		2						C-WE	Sim Target/WTT/TOFT	*1
STW 31	SLAM [Pro]	0.5	0.5	180	180	180	180		2						C-SLAM	Sim Target/WTT/TOFT	*1
STW 32	MK-80 [Exp]	1.0		120	120	180	180		2		6		5		4x82/3/4	Target	
STW 33	Rockets [Exp]	1.0		548	548	548	548		1		1				4xRct	Target	
STW 34	Cluster [Exp]	1.0		548	548	548	548		2						1xCBU	Target	
STW 35	LGB [Exp]	1.0		365	365	365	365		3						1xLGB	Laser Tactical Target	JDAM
ASU 20	SSC	1.0		180	180	365	365					10		6		Ship	
ASU 21	Harpoon [Pro]	0.2	0.8	180	180	180	180					7				WTT/TOFT	Flown in sim, reduce pts to 5. *1
MOB 20	A/R Day	1.0		92	120	365	365	6								Tanker	
MOB 21	A/R Night	1.0		92	120	270	270	7								Tanker	
MOB 22	KC-135 A/R	1.0		270	270	Ca	Ca	7								KC-135	
MOB 23	EmCon	1.0		365	365	365	365							6			
	T3 in STW	1.0		na	na	na	na				25	35	50				
STW 50	Coord Stk	1.0		180	180	180	180		3	3				6		Strike Pkg	
STW 51	CVW Fallon	1.0		Ta	Ta	3y	Ca		7	7	8			5			
STW 52	SFARP	1.0		Ta	Ta	3y	Ca		5	8	4			4			

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Figure 27. F/A-18 Training & Readiness Matrix (continued)

F/A-18 Matrix Notes

ABBREVIATIONS

Ta	Periodicity of once per turnaround.
Ca	Periodicity of once per career.
XX-4(2)	Division flight which may also be flown as a section; section flight
XX-2(4)	Section flight which may be also be flown as division
C-9	CATM-9
C-XX	Captive ordnance of the type XX.
Inert	MK-76/BDU-48 or inert MK-80 series weapons. Live ordnance may be substituted.
F/TF	FLIR / LTFLIR
WTT	Weapons Tactics Trainer Sim
OFT	Operational Flight Trainer Sim
TOFT	Tactical OFT Sim
[Exp]	Actual ordnance expenditure. MK-80 must be live, PGM can have inert warhead but must have seeker.
[Pro]	Missile delivery profile flown with captive ordnance.
BxX	Bogey support of the number X.

GENERAL NOTES

1. Pages 1 and 2 **(CORE MISSIONS & MISSIONS)** contain the same information; page 1 is sorted by "T" Level (1-4), page 2 is sorted by T&R Event number.

2. Normally only one of the events listed on page 1 or 2 **(CORE MISSIONS & MISSIONS)** of the matrix should be accomplished during any one sortie. Any number of additional events from page 3 **(ACTIONS)** may be accomplished during the same sortie.

3. Mission commanders determine the success or failure of each event, except in the case of SFWT checkrides which are passed at the discretion of the SFTI.

SPECIFIC NOTES

#1 The "Media" column defines whether the event is executed as an aircraft flight (F), a simulator (S), or either. When the numbers in these columns are higher than 1, repeating the event up to the total number continues to earn points. For example, STW4 can be flown twice sequentially, each flight earning four STW points and each flight having a periodicity of 31 days (for a Level 1 pilot).

#2 Other than addressed in note #1, points are only awarded for one completion of an event within the specified periodicity. If a reduced number of points has previously been awarded due to simulator or section/division considerations, those points can be increased to the full number by flying the event to get full (but not additional) credit. For example, if an AAW2 flight is executed as a section, it earns 3 AAW points instead of 5; flying it again as a section does not increase the point total. Flying it again as a division increases the point total to 8, but not to the combined total of 10.

#3 FCLPs and ACLS/CQ EMER trainers are not intended to be flown on a structured periodic cycle, but in preparation for an at sea period. Annual FCLP flight hours are based on the requirements for the annualized IDTC at sea periods.
All aircrew FCLP complete in preparation for CQ or "CQ current" obtain full PMA points for FCLP. All others receive (0) PMA points.

*1 Where there are options of flights or simulators for the same event, resourcing of each is determined according to the fractions in the "Media" column of the matrix. "Media" numbers are based on sorties (aircraft or simulator), not flight/simulator hours.

*2 As described in the WTM under AAW 08, sorties flown as adversary presentations in support of training requirements may be used to qualify for mission AAW 08 (TACINT). They will not qualify for other events unless aircrew have the opportunity to plan, brief and execute their preferred "blue air" tactics.

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Figure 27. F/A-18 Training & Readiness Matrix (continued)

*3 FCLP, CQ and CQSIM requirements are tabulated at the rate of 2.1 FltHr/mo/plt for FCLP, 0.6 FltHr/mp/plt for CQ and 0.6 SimHr/mo/plt for CQSIM. Applying the specified emphasis levels to these rates produces the anticipated resource requirements at each readiness level. Readiness levels of a notional turnaround cycle will result in a total requirement of approximately 16.5 FltHr/yr/plt for FCLP and 4.5 FltHr/yr/plt for CQ.

*4 "Training Event Hours" requirement is based on ideal conditions. "Wx/Maint Aborts" accounts for the percentage of flights aborted for weather or maintenance. "Perf Fails/Sched" accounts for sorties which must be repeated due to performance failures, and those which are repeated at a non-optimal periodicity due to real-world scheduling constraints such as flight lead/wingman pairing, holidays, adversary and range availabilities, acts of God, etc.

*5 FCF rates based on an average requirement of 150 FCF's per year. Transit rates based on two cross-country trips for nine aircraft per turnaround.

*6 Inert a/g ordnance requirement assumes 10% of inert requirement is met with inert MK-80 series (2 each flight) and 90% is met with MK-76/BDU48 (3 each flight).

*7 Unless simulators become available for Japan-based squadrons, their media requirement for AAW8 increases to 2.0 Flights. This requires an additional 2.9 flight hours per pilot per month at each readiness level.

Days since last night current	%PMA points
14 days	100%
59 days	75%
6 months	50%
6-12 months	25%

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Figure 27. F/A-18 Training & Readiness Matrix (continued)

F/A-18 Squadron Readiness Requirements

	# SFWT Level Pilots (1)				AAW (2)		STW (2)								MIW (2)
	L4	L3	L2	L1	IR Missile Exp (3)	Radar Msl Exp (3)	Strike Lead	SLAM Exp (3)	SLAM WTOs	NVG Qual	Maverick Exp (3)	LGB Exp (3)	LGTR Exp (3)	HARM Exp (3)	Mining School Grads
T1	5	5	5	2	4	3	4	1	2	14	2	6	17	1	1
T2	4	5	4	3	3	2	3	0	1	12	1	2	15	0	1
T3	4	4	4	3	2	1	2	0	1	10	0	0	13	0	0

NOTES:

(1) In addition to the specified number of points from the mission and action matrices, the specified number of SFWT pilots who must also be on board in order to report the specified readiness in AAW and STW.

(2) Readiness in the listed PMA's requires completion of the events specified in this table in addition to the proper point totals from the mission and event matrices.

(3) Weapon expenditures specified above refer to aircrew on board who have expended the specified weapon.

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Figure 28. F/A-18 Training & Readiness Resource Summary

COMNAVAIRPACINST 3500.67E/
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F/A-18 Resource Summary

	To Achieve:			
FLIGHT HOUR SUMMARY				
(CREW/MONTH)	T-3	T-2	T-1	100%
TOTAL HOURS	17.9	21.0	24.6	28.0
TRAINING HOURS	9.9	11.6	13.6	15.5
TRANSIT HOURS	8.0	9.4	11.0	12.5
TOTAL SORTIES	12.3	14.5	17.0	19.3
(SQUADRON/YEAR)	T-3	T-2	T-1	100%
TOTAL HOURS	3651.6	4284.0	5018.4	5712.00
TRAINING HOURS	2019.6	2366.4	2774.4	3162.0
TRANSIT HOURS	1632.0	1917.6	2244.0	2550.0
TOTAL SORTIES	2509.2	2958.0	3468.0	3937.2

	To Achieve:			
SIMULATOR SUMMARY				
(CREW/MONTH)	T-3	T-2	T-1	100%
2F132 HOURS	0.3	0.6	0.6	0.6
2E7 HOURS	3.5	3.5	3.5	3.5
(SQUADRON/YEAR)	T-3	T-2	T-1	100%
2F132 HOURS	61.2	122.4	122.4	122.4
2E7 HOURS	714.0	714.0	714.0	714.0

	To Achieve:			
ORDNANCE SUMMARY				
(CREW/YEAR)	T-3	T-2	T-1	100%
MK76/BDU48*	85	163	234	240
INERT MK-80 SERIES	7	14	19	20
LIVE MK80 SERIES	12	12	12	12
CLUSTER	0	1	1	1
20 MM	1332	1332	1730	1730
PGM (WALLEYE, JSOW, JDAM, MAV OR SLAM)	0	0	0	0
LGTR	4	9	12	12
LASER MAVERICK	0	0	0	0
IR MAVERICK	0	0	0	0
CHAFF**	194	247	318	354
FLARES**	104	132	170	189
CATM-9	81	103	125	148
LUU-2 PARAFLARE	0	0	1	1
LIVE/INERT GBU	0	1	1	1
AIM-9 LIVE FIRE	0	0	0	0
RADAR MSL LIVE FIRE	0	0	0	0

*10% OF INERT ORD = HEAVY INERT
**15 CHAFF/8 FLARES PER EVENT

(SQUADRON/YEAR)	T-3	T-2	T-1	100%
MK76/BDU48*	1445	2771	3978	4080
INERT MK-80 SERIES	119	238	323	340
LIVE MK80 SERIES	207	207	207	207
CLUSTER	0	11	11	11

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Figure 28. F/A-18 Training & Readiness Resource Summary (continued)

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20 MM	22644	22644	29410	29410
PGM (WALLEYE, JSOW, JDAM, MAV OR SLAM)	0	7	7	7
LGTR	68	153	201	201
LASER MAVERICK	0	2	2	2
IR MAVERICK	0	2	2	2
CHAFF**	3298	4199	5406	6018
FLARES**	1768	2244	2890	3213
CATM-9	1377	1751	2125	2516
LUU-2 PARAFLARE	0	0	23	24
LIVE/INERT GBU	0	17	17	17
AIM-9 LIVE FIRE	0	0	5	5
RADAR MSL LIVE FIRE	0	0	5	5

*10% OF INERT ORD = HEAVY INERT
**15 CHAFF/8 FLARES PER EVENT

RANGE SUMMARY
(DOES NOT INCLUDE NFL AIR WING & SFARP)

(HOURS/CREW/YEAR)	To Achieve: T-3	T-2	T-1	100%
TARGET RANGE WITH EW CAPABILITY	0.0	8.0	11.4	11.4
LIVE TARGET RANGE	4.8	4.8	4.8	4.8
SCORED TARGET RANGE	44.0	72.0	72.0	80.0
LIVE + LASER SAFE TARGET RANGE	0.0	0.0	0.7	0.7
LASER SAFE RANGE	17.0	22.0	27.0	27.0
AIR-TO-AIR RANGE REQUIRED	85.0	140.0	140.0	155.0
CLUSTER WEAPON APPROVED RANGE	2.0	2.0	2.0	2.0
PARAFLARE CAPABLE + SCORED TARGET RANGE	0.0	0.0	1.6	1.6

(HOURS/SQUADRON/YEAR)	T-3	T-2	T-1	100%
TARGET RANGE WITH EW CAPABILITY	0.0	136.0	193.8	193.8
LIVE TARGET RANGE	81.6	81.6	81.6	81.6
SCORED TARGET RANGE	748.0	1224.0	1224.0	1360.0
LIVE + LASER SAFE TARGET RANGE	0.0	0.0	11.3	11.3
LASER SAFE RANGE	289.0	374.0	459.0	459.0
AIR-TO-AIR RANGE REQUIRED	1445.0	2380.0	2380.0	2635.0
CLUSTER WEAPON APPROVED RANGE	34.5	34.5	34.5	34.5
PARAFLARE CAPABLE + SCORED TARGET RANGE	0.0	0.0	27.2	27.2

Support/Adversary Summary

(SORTIES/CREW/YEAR)	To Achieve: T-3	T-2	T-1	100%
ADVERSARY SUPPORT REQUIRED	105.0	163.0	192.0	192.0
USN TANKER/DROGUE-CAPABLE TANKER	4.0	4.0	8.0	8.0
USAF KC-135 TANKER	2.0	2.0	4.0	4.0
VR/IR ROUTE	5.0	7.0	12.0	12.0
AIR-TO-AIR GUNNERY	0.0	0.0	1.0	1.0
ECM PODS/JAMMERS CARRIED BY ADVERSARY	0.0	0.0	4.0	6.0

(SORTIES/SQUADRON/YEAR)	T-3	T-2	T-1	100%
ADVERSARY SUPPORT REQUIRED	1785.0	2771.0	3264.0	3264.0
USN TANKER/DROGUE-CAPABLE TANKER	68.0	68.0	136.0	136.0
USAF KC-135 TANKER	34.0	34.0	68.0	68.0
VR/IR ROUTE	85.0	119.0	204.0	204.0
AIR-TO-AIR GUNNERY	0.0	0.0	17.0	17.0
ECM PODS/JAMMERS CARRIED BY ADVERSARY	0.0	0.0	68.0	102.0

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Figure 28. F/A-18 Training & Readiness Resource Summary (continued)

T/M/S SPECIFIC VARIABLES

AVG HOURS/SORTIE	1.5
AVG EVENT HOURS/SORTIE	0.8
AVG TRANSIT TIME/SORTIE	0.7
CREWS/SQDN	17
FCLP(FLTHR/MO/CREW)	2.1
CQ(FLTHR/MO/CREW)	0.6

	To Achieve:			
	T-3	T-2	T-1	100%
WX/MAINT ABORTS	0.9	1.1	1.3	1.4
PERF FAIL/SCHED	1.3	1.5	1.8	2.0
DET TRANSITS	0.3	0.3	0.3	0.3
FCFs (HISTORICAL AVG 150/YR)	0.7	0.8	0.8	0.8
TOTAL OVERHEAD	3.2	3.7	4.2	4.5

Figure 29. F/A-18 Training & Readiness Event Descriptions

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F/A-18 Event Descriptions

Anti-Air Warfare

AAW 1 - OCA (NTA 3.2.3.). Establish local air superiority through Offensive Counter Air operations by performing division sweep (air superiority or pre-strike) or force protection (escort or BARCAP) mission.

AAW 2 - DCA (NTA 3.2.7). Establish local air superiority through Defensive Counter Air operations by performing division point, area, or High Value Aircraft defense mission.

AAW 3 - D/OCA (NTA 3.2.3, 3.2.7). Establish local air superiority through Offensive or Defensive Counter Air operations by performing division sweep (air superiority or pre-strike), area/HVA defense, or force protection (escort or BARCAP) mission.

AAW 4 - BFM-D (NTA 3.2.7). Establish air superiority against a Category IV adversary in the visual arena from various defensive start parameters.

AAW 5 - BFM-O (NTA 3.2.7). Establish air superiority against a Category IV adversary in the visual arena from various defensive start parameters.

AAW 6 - BFM-H (NTA 3.2.3, 3.2.7). Establish air superiority against a Category IV adversary in the visual arena from various high aspect start parameters.

AAW 7 - A/A GUN (NTA 3.2.2, 3.2.7). Enhance ability to Engage and Neutralize Enemy Aircraft and Missile targets throughout the Engagement envelope of the M61-A1/2 cannon.

AAW 8 - TACINT (NTA 3.2.3, 3.2.7). Establish local air superiority by integrating and synchronizing attacks on enemy air capabilities through Offensive or Defensive Counter Air operations by performing tactical all weather intercepts throughout the engagement envelopes of organic systems.

AAW 9 - AAWSIM (NTA 3.2.3, 3.2.7). Establish local air superiority through Offensive or Defensive Counter Air operations by performing division sweep (air superiority or pre-strike), area/HVA defense, or force protection (escort or BARCAP) mission.

AAW 20 - HIFAST INT (NTA 3.2.3). To maintain air superiority against high, supersonic adversaries.

AAW 21 - 2vX (NTA 3.2.3). To maintain air superiority in the multi-bogie, visual engaged maneuvering environment.

AAW 22 - ECCM (NTA 3.2.3). To maintain air superiority against electrically emitting aircraft. ECCM.

AAW 23 - SCREEN TGT (NTA 3.2.3). To establish air superiority against aircraft protected by electronically emitting aircraft. Screened Target.

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Figure 29. F/A-18 Training & Readiness Event Descriptions (continued)

COMNAVAIRPACINST 3500.67E/
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AAW 24 - NIGHT AAW (NTA 3.2.3). To achieve air superiority on assigned mission at night.

AAW 25 - VID (NTA 3.2.7). To establish air superiority in visual positive identification environment against a forward quarter threat.

AAW 26 - MSI (NTA 3.2.3). To perform mission by using advanced tactics training program (ATTP) to fully integrate FA-18 multi-sensor capabilities in a threat environment.

AAW 27 - CHAFF (NTA 3.2.3). To disrupt or deny threat air and surface target track and missile guidance radars.

AAW 28 - FLARE (NTA 3.2.3). To disrupt or deny threat air and surface IR missiles.

AAW 29 - RDR MSL (NTA 3.2.3, 3.2.7). Detect and destroy an airborne threat aircraft with a radar missile.

AAW 30 - AIM-9 (NTA 3.2.3, 3.2.7). Detect and destroy an airborne threat aircraft with an IR missile.

Strike Warfare

STW 1 - STK-N (NTA 3.2.1, 3.2.2). Attack enemy land/maritime high value targets at or beyond the FEBA at night with the intent to degrade the ability of enemy forces to conduct coordinated operations and/or perform critical tasks.

STW 2 - STK-SE (NTA 3.2.1, 3.2.2). Attack enemy land/maritime high value targets at or beyond the FEBA, in a hostile AOB, with the intent to degrade the ability of enemy forces to conduct coordinated operations and/or perform critical tasks.

STW 3 - STK-4 (NTA 3.2.1, 3.2.2). Attack enemy land/maritime high value targets at or beyond the FEBA with the intent to degrade the ability of enemy forces to conduct coordinated operations and/or perform critical tasks.

STW 4 - STK-2 (NTA 3.2.1, 3.2.2). Attack enemy land/maritime high value targets at or beyond the FEBA with the intent to degrade the ability of enemy forces to conduct coordinated operations and/or perform critical tasks.

STW 5 - TGT ACQ (NTA 3.1). Positively identify and attack enemy land high value targets at or beyond the FEBA with the intent to degrade the ability of enemy forces to conduct coordinated operations and/or perform critical tasks.

STW 6 - CSAR (FA-18 Critical Task List 6.1, 6.2).
Conduct coordinated Combat Search and Rescue operations to identify ground and surface threat composition, locate survivor, destroy/neutralize threat, protect supporting assets and recover forces.

STW 7 - TGT ATTACK (NTA 3.2). To engage the enemy and destroy targets using all available organic firepower.

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Figure 29. F/A-18 Training & Readiness Event Descriptions (continued)

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STW 8 - LATT (NTA 3). Enhance ability to ingress, egress, maneuver and employ firepower in the low altitude environment with intent to degrade enemy defenses.

STW 9 - HARM (NTA 3.2.4). To coordinate, integrate and synchronize attacks, which neutralize, destroy or temporarily degrade enemy air defenses by destructive and/or disruptive means.

STW 10 - STW SIM (NTA 3.2.1, 3.2.2). Attack enemy land/maritime high value targets at or beyond the FEBA with the intent to degrade the ability of enemy forces to conduct coordinated operations and/or perform critical tasks.

STW 20 - NVD LoLVL (NTA 1.2, 3.2.2, 3.2.2). To navigate at low altitude to delay and/or deny detection by threat radars during night strike operations.

STW 21 - DAY LoLVL (NTA 1.2, 3.2.2). To navigate at low altitude to delay and/or deny detection by threat radars during day strike operations.

STW 22 - LST (NTA 3.2.1, 3.2.2, 3.2.6, 3.2.8.2). Locate and destroy a land target using the Laser Spot Tracker for target acquisition and/or designation.

STW 23 - S/A THREAT (NTA 3.2.1, 3.2.2, 3.2.6, 3.2.8.2). To defeat threat surface-to-air threats during strike fighter operations.

STW 24 - STRAFE (NTA 3.2.2, 3.2.6). To damage/destroy a land or sea target/threat using 20mm gun.

STW 25 - PARAFLARE (NTA 3.2.6, 3.2.8). To locate and destroy a target at night using paraflares for visual target illumination.

STW 26 - PGM (NTA 3.2.1, 3.2.2, 3.2.6). To locate and destroy a target using precision guided munitions during offensive strike operations.

STW 27 - LGTR (NTA 3.2.1, 3.2.2, 3.2.6, 3.2.8.1). To locate and destroy a ground target using precision LGTR during offensive strike operations.

STW 28 - L-MAV (NTA 3.2.1, 3.2.2, 3.2.6). To locate and destroy a target using a Laser Maverick during offensive strike operations.

STW 29 - I-MAV (NTA 3.2.1, 3.2.2, 3.2.6). To locate and destroy a target using an IR Maverick during offensive strike operations.

STW 30 - WALLEYE (NTA 3.2.1, 3.2.2, 3.2.6). To locate and destroy a target using a WALLEYE glide bomb during offensive strike operations.

STW 31 - SLAM (NTA 3.2.1, 3.2.2, 3.2.6). To locate and destroy a target using a SLAM during offensive strike operations.

STW 32 - MK-80 (NTA 3.2.1, 3.2.2, 3.2.6). To locate and destroy a target using General Purpose bombs during offensive strike operations.

STW 33 - ROCKETS (NTA 3.2.6). To locate and damage/destroy a target using rockets during offensive strike operations.

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Figure 29. F/A-18 Training & Readiness Event Descriptions (continued)

STW 34 - CLUSTER (NTA 3.2.1, 3.2.2, 3.2.6). To locate and damage/destroy a target using cluster weapons during offensive strike operations.

STW 35 - LGB/JDAM (NTA 3.2.1, 3.2.2, 3.2.6, 3.2.8.2). To locate and destroy a target using laser guided bombs during offensive strike operations.

STW 50 - COORD STK (NTA 3.2.1, 3.2.2). To conduct coordinated offensive strike operations in a threat environment against a land target.

STW 51 - CVW Fallon (NTA 3.2.2, 3.2.6). To conduct offensive strike operations against land targets in a threat environment.

STW 52 - SFARP (NTA 3.2.2, 3.2.3, 3.2.6, 3.2.7). To establish local air superiority while conducting offensive and defensive air-to-air and strike operations.

Mine Warfare

MIW 1 - MINE SIM (NTA 3.2.1, 3.2.1.1, 3.2.1.2). Lay minefield to degrade the ability of enemy forces to conduct maritime operations by denying use of sea-lanes and harbors.

MIW 2 - COORD MINEX (NTA 3.2.1, 3.2.1.1, 3.2.1.2). Lay coordinated minefield to degrade the ability of enemy forces to conduct maritime operations by denying use of sea-lanes and harbors.

Amphibious Warfare

AMW 1 - CAS-D (NTA 3.2.1, 3.2.2). Attack enemy land/maritime high value targets at or beyond the FEBA with the intent to degrade the ability of enemy forces to conduct coordinated operations and/or perform critical tasks.

AMW 2 - CAS-**N** (NTA 3.2.1, 3.2.2). Attack enemy land/maritime High Payoff and High Value targets at or beyond the FEBA with the intent to degrade the ability of enemy forces to conduct coordinated operations and/or perform critical tasks at night.

Anti-Surface Warfare

ASU 1 - WASEX (NTA 3.2.1, 3.2.2). Attack enemy land/maritime High Payoff and High Value targets at or beyond the FEBA with the intent to degrade the ability of enemy forces to conduct coordinated operations and/or perform critical tasks.

ASU 20 - SSC (NTA 2.2.3). To locate and identify surface contacts to achieve and/or maintain maritime superiority.

ASU 21 - HARPOON (NTA 2.2.3). To locate and destroy a surface target using a Harpoon during offensive strike operations.

Mobility

MOB 1 - FCLP (NTA 1.1.1.5). Conduct field carrier landing practice in all environmental conditions in order to prepare for shipboard operations.

Figure 29. F/A-18 Training & Readiness Matrix Event Descriptions (continued)

MOB 2 - CQ SIM (NTA 1.1.1.5). Conduct carrier landing practice in a simulator in order to prepare for shipboard operations.

MOB 3 - CQ (NTA 1.1.1.5). Conduct Carrier qualification in the day and night environment.

MOB 4 - AIR NAV (NTA 1.1.1.5). Conduct extended out of area training flights to enhance ability to conduct extended range operations and deploy worldwide.

MOB 5 - Instrument Check (NTA 1.1.1.5). Maintain instrument flight currency per OPNAV Instruction 3710 (series).

MOB 6 - NATOPS Check (NTA 1.1.1.5). Maintain FA-18 NATOPS currency per OPNAV Instruction 3710 (series).

MOB 20 - A/R DAY (NTA 4.2.1.2). To conduct day air-to-air refueling in support of mission requirements.

MOB 21 - A/R NIGHT (NTA 4.2.1.2). To conduct night air-to-air refueling in support of mission requirements.

MOB 22 - KC-135 A/R (NTA 4.2.1.2). To conduct KC-135 air-to-air refueling in support of mission requirements.

MOB 23 - EMCON (NTA 1.1.1.5). To deny enemy forces ability to locate carrier battle group assets by passive electronic means.

Figure 30. F/A-18 SHARP data example

Event Number	Qual	Aircrew	Date Received	Period	Expire	AAW	AMW	ASU	CCC	MIW	MOB	STW
009-12141999-09604-00	AAW03	Pilot 1	14-Dec-99	31	14-Jan-00	0	0	0	0	0	0	0
014-08051999-09604-00	STW02	Pilot 1	05-Aug-99	31	05-Sep-99	0	0	0	0	0	0	0
014-08051999-09604-00	AAW25	Pilot 1	05-Aug-99	31	05-Sep-99	0	0	0	0	0	0	0
027-10131999-09604-00	AAW01	Pilot 1	13-Oct-99	31	13-Nov-99	0	0	0	0	0	0	0
021-10141999-09604-00	MOB01	Pilot 2	14-Oct-99	62	15-Dec-99	0	0	0	0	0	0	0
007-12151999-09604-00	STW06	Pilot 3	15-Dec-99	180	12-Jun-00	0	0	0	0	0	0	0
001-12121999-09604-00	MOB04	Pilot 3	12-Dec-99	92	13-Mar-00	0	0	0	0	0	0	0
007-12141999-09604-00	STW05	Pilot 3	14-Dec-99	120	12-Apr-00	0	0	0	0	0	0	0
007-12141999-09604-00	STW29	Pilot 3	14-Dec-99	120	12-Apr-00	0	0	0	0	0	0	0
007-08021999-09604-00	AAW03	Pilot 3	02-Aug-99	62	03-Oct-99	0	0	0	0	0	0	0
007-08021999-09604-00	AAW24	Pilot 3	02-Aug-99	62	03-Oct-99	0	0	0	0	0	0	0
007-08021999-09604-00	AAW25	Pilot 3	02-Aug-99	62	03-Oct-99	0	0	0	0	0	0	0
003-08041999-09604-00	STW02	Pilot 3	04-Aug-99	62	05-Oct-99	0	0	0	0	0	0	0
003-08041999-09604-00	AAW21	Pilot 3	04-Aug-99	92	04-Nov-99	0	0	0	0	0	0	0
003-08041999-09604-00	STW32	Pilot 3	04-Aug-99	180	31-Jan-00	0	0	0	0	0	0	0
002-08111999-09604-00	STW07	Pilot 3	11-Aug-99	120	09-Dec-99	0	0	0	0	0	0	0
011-08111999-09604-00	AAW06	Pilot 3	11-Aug-99	92	11-Nov-99	0	0	0	0	0	0	0
003-08121999-09604-00	STW02	Pilot 3	12-Aug-99	62	13-Oct-99	0	0	0	0	0	0	0
011-08181999-09604-00	AAW03	Pilot 3	18-Aug-99	62	19-Oct-99	0	0	0	0	0	0	0
007-08191999-09604-00	STW05	Pilot 3	19-Aug-99	120	17-Dec-99	0	0	0	0	0	0	0
007-08191999-09604-00	STW52	Pilot 3	19-Aug-99	30000	07-Oct-81	4	2	0	2	0	0	2.5
004-08231999-09604-00	STW07	Pilot 3	23-Aug-99	120	21-Dec-99	0	0	0	0	0	0	0
004-08231999-09604-00	STW52	Pilot 3	23-Aug-99	30000	11-Oct-81	4	2	0	2	0	0	2.5
008-09091999-09604-00	AMW01	Pilot 3	09-Sep-99	92	10-Dec-99	0	0	0	0	0	0	0
008-09091999-09604-00	AAW28	Pilot 3	09-Sep-99	92	10-Dec-99	0	0	0	0	0	0	0
008-09091999-09604-00	STW52	Pilot 3	09-Sep-99	30000	28-Oct-81	8	4	0	4	0	0	5
021-09091999-09604-00	STW01	Pilot 3	09-Sep-99	92	10-Dec-99	0	0	0	0	0	0	0
021-09091999-09604-00	STW27	Pilot 3	09-Sep-99	62	10-Nov-99	0	0	0	0	0	0	0
021-09091999-09604-00	STW52	Pilot 3	09-Sep-99	30000	28-Oct-81	8	4	0	4	0	0	5
016-09141999-09604-00	STW02	Pilot 3	14-Sep-99	62	15-Nov-99	0	0	0	0	0	0	0
016-09141999-09604-00	AAW27	Pilot 3	14-Sep-99	92	15-Dec-99	0	0	0	0	0	0	0
016-09141999-09604-00	AAW28	Pilot 3	14-Sep-99	92	15-Dec-99	0	0	0	0	0	0	0
016-09141999-09604-00	STW21	Pilot 3	14-Sep-99	120	12-Jan-00	0	0	0	0	0	0	0
016-09141999-09604-00	STW52	Pilot 3	14-Sep-99	30000	02-Nov-81	8	4	0	4	0	0	5
001-09081999-09604-00	AAW02	Pilot 3	08-Sep-99	62	09-Nov-99	0	0	0	0	0	0	0
001-09081999-09604-00	AAW25	Pilot 3	08-Sep-99	62	09-Nov-99	0	0	0	0	0	0	0

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