DNASNOTE 3120
30 Apr 12

NAVAL ACADEMY SAILING

OFFSHORE SAIL TRAINING SQUADRON

2012 EXPERIENTIAL LEADERSHIP GUIDE

FOR

LARGE SAIL TRAINING CRAFT

AT

THE UNITED STATES NAVAL ACADEMY

DIRECTOR NAVAL ACADEMY SAILING NOTICE 3120

From: Director, Naval Academy Sailing

Subj: NAVAL ACADEMY SAILING OFFSHORE SAIL TRAINING SQUADRON (OSTS) 2012 EXPERIENTIAL LEADERSHIP GUIDE

Ref: (a) DNASINST 3120.1E, Standard Operating Procedures (SOP) and Regulations Manual for U.S. Naval Academy Sail Training Craft
(b) Boat Information Book for U.S. Naval Academy Navy 44 Sail Training Craft

Encl: (1) OSTS 2012 Experiential Leadership Guide

1. Purpose. To promulgate the 2012 Experiential Leadership Guide to be used aboard large Sail Training Craft (STC) of the U.S. Naval Academy involved in the offshore sail training squadron cruises.

2. Background. The Naval Academy conducts sail training aboard a variety of STC. This notice augments guidance contained in references (a) and (b), and guides the professional sail training of midshipmen.

3. Action. The actions described within this experiential leadership guide, Enclosure (1), should be viewed as recommendations. They are to be implemented by individual STC Skippers consistent with their judgment for their individual midshipmen crew, and the goals of Naval Academy Sailing.

4. Feedback/Changes. Any person who finds omissions or has recommendations for changing any part of this notice may submit the feedback to the Director, Offshore Sail Training Squadron.

L. SPANHEIMER
Director, Naval Academy Sailing

Distribution:
OSTS Skippers and Executive Officers

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OFFSHORE SAIL TRAINING SQUADRON (OSTS) EXPERIENTIAL LEADERSHIP GUIDE

Preface.

The Offshore Sail Training Squadron (OSTS) employs sailing as the vehicle for the larger goal of leadership development within the mission of the United States Naval Academy. The primary objective is providing hands-on, personal experience in the principles, application and challenges of small unit leadership. Small unit leadership is normally the first responsibility of new Navy and Marine Corps officers and is a sine qua non of their professional development.

This Guide is intended as a working reference for leaders of OSTS and for volunteers and midshipman sailing in individual cruise blocks. It summarizes selected leadership principles taught in the academic curriculum and links these principles to responsibilities and practices on board the large Sail Training Craft (STC). It also contains a number of personal experiences ("sea stories") from within the OSTS program that reinforce the principles and practices of effective leadership.

The Guide is a combined effort of the Naval Academy Division of Professional Development, the Division of Leadership Education and Development, the Navy Sailing staff, and volunteers (military and civilian) serving in OSTS.

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CHAPTER 1

1.0 INTRODUCTION TO EXPERIENTIAL LEADERSHIP

Leadership is learned most effectively by personal experience. Specifically, the desired experience includes real world consequences and results, experimentation in actively influencing others and situations, and personal reflection on the experience, goals, and priorities. Academic research and literature on leadership development substantiate that experiential opportunities in which leaders must actively practice their craft provide the most meaningful and enduring lessons of leadership.

In an ideal situation, the novice leader would understand the task and the desired outcome, he / she is afforded the means and responsibility to execute the task, and then pursues the task to an end result. They would be allowed to fail with real world outcomes and impact – not just a graded exercise or subjective critique. The balancing act is room to fail while minimizing unacceptable impact (personal injury, compromise of mission, or material damage).

1.1 HISTORY

Early Naval Academy efforts involving the academic concept of experiential leadership occurred in 2004 with a collaborative summer training endeavor with the National Outdoor Leadership School (NOLS). It focused on leadership experience in an environment of wilderness expeditions ranging from sea kayaking in Alaska to mountaineering in Wyoming. NOLS promotes effective teamwork and leadership by defining four roles for expedition members (designated leadership, active followership, peer leadership, and self discipline). Nine skills are expected: competence, judgment, decision making, expedition behavior, communications, tolerance for adversity and uncertainty, self awareness, vision, and action.

When integrated with the Naval Academy's formal leadership curriculum and offered to complement existing summer programs, NOLS expeditions provided valuable reinforcement of the Academy's core values and attributes of graduates. Since 2004 to now (2012) more than 900 midshipmen have attended NOLS-USNA courses and the initiative has grown to 14 separate NOLS-USNA courses (types of expeditions).

The roots of the current Offshore Sail Training Squadron (OSTS) program date to 1940 when the Naval Academy procured the first three wooden (and without auxiliary power) Luders class yawls as sail training craft (STC) – ALERT, INTREPID and RESOLUTE. From the beginning, these boats provided realistic and valuable summer experience that reinforced classroom instruction in seamanship, navigation, and similar skills. But leadership training, per se, happened upon the initiative of individual skippers within the program. There was little focused or coordinated effort to address the leadership opportunities for midshipmen inherent with preparing for deployment and operating each STC at sea (with the exception of midshipmen Skippers and XOs).

Late in 2010, several OSTS volunteers initiated an effort to bring leadership to the forefront and focus on these opportunities for all midshipmen participating in OSTS. This was supported strongly by the Director, OSTS and by the Division of Leadership Education and Development. The initial term was a "Leadership Initiative" and sought to link the academic curriculum to existing on-water practices within the program. The vision from the outset was to place meaningful responsibility for execution of an OSTS block in the hands of the midshipman crew. One of the XO volunteers in the summer of 2010 was also a key player in the NOLS program and the parallels between NOLS and the Experiential Leadership Guide were substantial and intentional.

Building on the earlier NOLS experience, the Leadership Education and Development Division in 2010 had also undertaken extra-curricular and co-curricular activities to enhance the concept of experiential leadership. Feedback on the OSTS Experiential Leadership and on-water experience from OSTS participants during the summer 2011, both in formal post-block critiques and word of mouth, was very positive. The momentum was building and "experiential leadership" gained broader recognition across

the Yard and was subsequently recognized and supported in the priorities of the Commandant of Midshipmen and the Superintendent of the Naval Academy.

1.2 EXPERIENTIAL LEADER DEVELOPMENT AT USNA TODAY

The implementation of the experiential leadership concept is unique in each application or activity. A Department of Leader Development and Research was established in 2011 with responsibility for further development and coordination of the concept for the Naval Academy. In addition to OSTS, experiential leadership has been introduced for the midshipmen leaders of the Plebe Summer Detail and will be undertaken in the YP Squadron / summer program. Experiential leadership training is also being prepared for captains of varsity athletic teams.

In recognition of being part of, and a leader in the broader program of experiential leadership across Naval Academy activities, the Director of Naval Academy Sailing has implemented the "Experiential Leadership Guide" for the Offshore Sail Training Squadron. This guide is intended to facilitate the transfer of academic concepts of leadership to the experience of leading on the water, and to promote the reflection process so critical to making sense of the experience for developing leaders.

CHAPTER 2

2.0 PRINCIPLES OF LEADERSHIP

Intent. Summarize selected principles of leadership taught in the plebe academic curriculum in order to establish common ground and terminology for midshipmen and Skippers / Executive Officers (XO).

Discussion. These selected principles of leadership were taught in classroom sessions conducted as part of the OSTS Winter training. They are summarized here as a ready reference and refresher.

The classroom sessions were recorded and are available on-line for individuals registered with the OSTS Director as a Skipper or XO, and for individuals undergoing training as prospective Skippers and XOs. The link for the recorded sessions is http://hera-usna.tegrity.com.

2.1 REFLECTION

Careful and deep consideration of personal experiences, observations, values, goals, priorities. Reflection leads to better understanding of ourselves and others. Self calibration. Recurring/routine reflection provides desirable feedback leading to better performance and results.

- Reflection is an antidote to non-stop activity devoid of self assessment. Conversely, reflection in the extreme leads to inactivity and stagnation. Desirable balance (both active and reflective) stimulates "reflective action" in which introspection influences future actions that are consistent with standards, values, goals and priorities.

- Natural reflection – the significance of a happening stimulates an evaluation. Recurrent reflection (desirable) – part of personal routine (while jogging, during evening down time). Systematic reflection is the process employed by an individual; may include personal assessment, interactions with others (family, mentors, contemporaries).

- Mr. David Kolb considers reflection one of four key factors in a continuous circle that makes up the experiential learning process: experience, reflection, conceptualization (formulating), experimentation (testing), and back to experience.[1]

2.2 SOCIAL INFLUENCE

Change in behavior (observable actions) caused by real or imagined pressure from others. Contrasts with persuasion i.e. changes in attitudes or beliefs. Can be a hazard for critical thinking.

Social influence based on three psychological goals: desire to choose correctly, gain approval, manage self-image. Individuals yield to social influence rather than exercise social influence.

- Three major types of social influence: Conformity – match response/actions of others (e.g. Asch's line experiment). Compliance – response to direct request. Obedience – subset of compliance, response to directive from authority figure (e.g. military orders or Migram shock experiment).

- Choosing correctly. Decision that is based on influence of authority figures or on validation (based on group influence, an interpersonal (rather than objective) way to choose). Both can happen when uncertain how to act, often in situations with difficulty/ ambiguity. A shortcut or "lazy thinking", may be able to choose correctly without own hard thinking.

[1] David A. Kolb, Experiential Learning: Experience as the Source of Learning and Development (Prentice Hall, 1983)

- "Captainitis" - seen in military service and in civil aviation. Deferring to the commander, even in cases where commander was wrong (Air Florida crash into the Potomac, P-3 destroyed during landing in Afghanistan). Influence particularly strong when authority figure seen as "expert."

- Gaining approval. Decision based on likelihood of acceptance/approval by the group. Behaviors that gain social approval: give back to those who have given first (reciprocity), submission in order to gain acceptance. Less likely if individual has personal confidence or lacks strong identity with the group.

2.3 GROUP DYNAMICS

Factors that affect performance of a group.

Reasons for groups: Accomplish tasks or goals (primary), meet social needs including security / identity /acceptance (secondary but important to individual).

Stages of group development: forming (determine behaviors and expectations for members of group), storming (conflict and disagreement), norming (standards and roles develop, cohesiveness builds), performing (task performance resulting from flexible relationships).

Factors affecting performance of group:

- Presence of others: improved performance (social facilitation) or decreased performance (social inhibition).

- Group size increasing: social loafing (some members contribute less), more likely to have rules and set procedures, job satisfaction may decrease.

- Composition: heterogeneous (increased range of ideas), homogeneous (limited perspective).

- Norms: frame of reference, appropriate and inappropriate behavior.

- Role ambiguity or conflict: uncertainty or different understanding of expectations.

- Cohesiveness: promoted by similar attitudes and goals, size of group (smaller normally increases cohesiveness), system of recognition and rewards, challenges or threats to group.

Leader's tasks: Assess skills of team members (avoid social loafing or inhibitions), communicate expectations (reinforce norms and avoid ambiguity), provide training and resources (minimize conflict), recognize good performance and desired behaviors (rewards).

2.4 CRITICAL THINKING

An approach or discipline for thought leading to improved communications, results and decisions. Critical thinking seeks to identify issues, gather relative information, establish well-reasoned conclusions and promote open thought. May be contrasted with egocentric thinking which may make sense, but may not be correct.

Carl von Clausewitz. "*the ability to keep one's head at times of exceptional stress and violent emotion.*"

Employs two sets of principles: "Universal Intellectual Standards" (rigor of thinking) and "Elements of Thought" (scope of thinking).

- Universal Intellectual Standards: Clarity – elaboration not needed; Accuracy – true, factual; Precision – statement is specific; Relevance – addresses topic at hand; Depth – considers complexity of

the question; Breadth – considers multiple perspectives; Logic – makes sense; Significance – places issue in context; Fairness – questioning and open minded.

- Elements of Thought: Purpose – goal or objective; Question – issue defined; Information – facts, data, evidence, experience; Concepts – ideas, theories, laws, principles, values, hypotheses; Inference – interpretations or conclusions; Assumptions – beliefs taken for granted (may be in the subconscious); Point of View – perspective, what is seen and how it is seen.

2.5 VALUES

Qualities / standards that individuals believe are important. They influence actions, judgment, and choices. Decisions are usually based on the personal values of the individual. Values are fundamental to human behavior.

Sources: People, family, school, religion, politics, military, media, experience.

Stages of development: Acceptance - influence of others (early childhood). Choice - based on alternatives or consequences (ages 8 – 16). Commitment - taking a stand, acting in accordance with values (ages 16-23+).

Two subsets: Our own values (personal) and collective values (groups of which we are a part - family, work and social groups, geographic regions, national).

Managing value conflicts and influencing values of others.

- Internal conflict – personal values opposed to one another. Difficult for self because two perceived rights cannot be equally satisfied.

- External (interpersonal) conflict – personal values vs. those of an outside set. Because values are subjective, external differences will likely result in stand-off, neither party likely to relinquish own values. Reasoning / argument not constructive. Resolution will probably come from another path.

2.6 GOALS

Provide focus, promote strategy and action, regulate effort and resources, enhance commitment / persistence.

Goals should be SMART.

- **S**pecific – precise, not general statements.

- **M**easurable – should have a metric by which to judge achievement.

- **A**ttainable – realistic and achievable, while also challenging.

- **R**esults oriented – desired outcome; words such as complete, acquire, produce, increase, decrease.

- **T**ime bound – a deadline for completion.

Insights: Self set goals, assigned goals, group determined goals are equally effective. Feedback promotes achievement. Challenging goals lead to higher performance. Goals should support rather than threaten.

Leader's tasks: Explain, coach, provide resources, relate personal goals to group goals. Promote commitment to specific goal achievement.

2.7 PERSONAL MISSION DEVELOPMENT

Desired outcome of this topic within the academic leadership curriculum is a one sentence "Life Mission Statement." While there is no expectation within OSTS for a similar statement, it is appropriate to understand perspectives of personal fulfillment.

A common view of "pursuit of happiness" may include realization of ease, gratification, and goals achieved; a condition of comfort, pleasure, and having enough of everything. A truer version posits continued striving that places the individual in a bigger picture. Fulfillment comes, not from achievement followed by idleness, but from continuing effort in a larger context of purpose than self. And it involves full use of one's talents and potential.

Human beings, by nature, are seekers of meaning. We seek to understand where we fit into the broader scheme of things; we seek to find purpose and sense to our own existence. Early on, it may be expressed as a "search for identity." Later, there is an ongoing weighing of our own judgments within a larger system of values and standards. We are concerned with purpose, meaning, and commitment.

John Gardner in Self Renewal: "Endless learning and trying is a way of living, a way of thinking, a way of being awake and ready." Happiness is continuing effort toward objectives larger than the individual.[2]

Want to do a Life Mission Statement? Should include: What am I going to do? To whom or for whom am I going to do it? How will I do it?

2.8 INTERPERSONAL COMMUNICATIONS

Listening skills.

Six steps of the listening process.

- Hearing: the physiological process, sound waves to interpretation by the brain.
- Focus: manage the distractions – environmental, physiological (below), psychological (below).
- Comprehend: attach meaning. Includes factors other than actual words (voice tone, inflection, body language).
- Analyze / evaluate: beyond face value, assess speaker's attitudes and emotions.
- Feedback: good feedback is immediate, honest, supportive. Eye contact, facial expression, head movement, verbal response, questions, paraphrasing.
- Remember: repetition (use of names), mnemonics (memory aid), notes.

Barriers to good listening: environmental (noise, physical discomfort), physiological (we think 5X faster than speech, physical disorder/sickness, mispronunciation), psychological (preconceptions, assumptions, selective listening, attitude, reaction to certain words (connotation of certain word vice literal meaning)).

Good listening: Listen quietly, minimize distractions, paying attention requires energy, use pauses to reflect, identify main points, content not style, paraphrase/question, don't react to emotional words, provide feedback, read between the lines/beyond the words.

2.9 Ownership (of orders/directives): Basic principle – orders/directives should be stated as if they are your own and not as originating from someone else (and particularly from someone senior).

[2] John W. Gardner, Self-Renewal: The Individual and the Innovative Society (WW Norton & Company 1995)

There is a natural tendency, when faced with implementing directions that may encounter “push back” (objection or disagreement) from subordinates or peers, to phrase them as coming from someone else and thereby mitigate the situation for oneself. Responsibility for the directive is deflected to the originator rather than taking personal ownership. Sometimes characterized as “lazy orders” or “Damn Exec” syndrome (i.e., “Damn XO says _____”). Giving orders to subordinates and attaching the originator’s name to them does not support the chain of command and has long term adverse effects on attitude, performance and unit integrity.

It may be appropriate – in a one-on-one situation with your superior – to question or ask “why” when receiving a directive. But when confirmed or agreed upon, ownership is taken and the order is passed on and carried out as if it were your own.

Issues with the “Damn Exec” approach:

- Demonstrates lack of ownership and “buy-in” to organizational goals.

- Subordinates may see you as only a puppet or mouthpiece of higher authority, lacking personal authority and responsibility.

- Subordinates may question decisions you make/ orders you originate.

Personal ownership of orders/directives is a fundamental responsibility at each level in the chain of command. “Damning the Exec” may be subverting your leadership role through loss of respect and support of your crew.

CHAPTER 3

3.0 EXERCISING LEADERSHIP

Intent. Summarize selected topics of leadership that are taught in the upper class academic curriculum, again to provide a common understanding for midshipmen and Skippers / Executive Officers (XO) for actions of leaders.

Discussion. Successful performance within OSTS depends on the integration of the knowledge and skills of individual crew members and coordinated execution of numerous tasks and evolutions. Effective teamwork is required for safety of operations and achievement of the assigned mission. This section builds on the Principles of Leadership (psychology and thinking) by addressing topics of implementation and practices.

3.1 LEADING TEAMS

Why this is important.

- The OSTS mission is carried out by the crew of each sail training craft (STC). For our purposes, each crew is a team (see below). Leadership occurs at all levels and effective leadership is critical to performance and mission success.
- While Skippers and XO's are the leaders of the overall team, midshipmen are expected to perform leadership roles within the team by virtue of watchstation responsibilities (ex: Watch Captain, Helm, and Nav Watch) and also by training shipmates and overseeing various STC evolutions (examples: operating systems and performing maintenance, loadout for deployment, preparations for underway, food preparation and galley cleanup).
- Organization of teams and tasks of leaders are fundamental.

Both groups and teams may be characterized by (1) Mutual interaction and (2) Reciprocal influence. But teams have greater specialization in four important ways.

- Teams have a stronger sense of common identification among themselves.
- Teams have common goals or tasks on which there is a high degree of consensus.
- Teams have a high degree of task interdependence.
- Members of teams have more differentiated tasks and specialized roles.

Team design – things the leader must consider (first) in organizing the team and (then) assessing performance.

- Task structure: Nature of the tasks within the team, whether tasks are technical or adaptive (broader or more general), and alignment of tasks with mission.
- Capabilities and limits of team: size and makeup; knowledge, skills, and interdependence of members; personal dynamics between members.
- Expectations and standards:
  - Are they imported from outside and / or set by the team?
  - Do they support the team objectives?
  - Do they support or challenge teamwork?

Key tasks for leaders.

- Setting and enforcing high standards of performance. Arguably, this is the most important task. Leaders routinely set (speak) high standards; the hard part is enforcing, on-going identification and correction of poor performance.
- Communicating a clear purpose or mission.
- Planning and organizing tasks of the team.
- Securing necessary resources.
- Assessing performance, suitability, and skills of team members
- Establishing high levels of feedback and interaction.
- Minimizing interpersonal conflict.

3.2 DECISION MAKING

Why this is important.

- Making decisions is a key and on-going activity of leaders.
- How decisions are made, as well as the decisions themselves, can enhance or degrade team / unit performance.
- Decision making is strongly influenced by the situation and members of the team.

Range of decision making.

- Intuitive or time critical – "just do it (decide)" or choice based on clear alternatives
- Analytical - thinking carefully and broadly before deciding.
- Many gradations in between.

Drivers for decision making.

- Time. Some situations may be true time critical, but most are not. Timeliness is always desirable, but immediate action may not be required.
- Experience of decision maker (includes personal knowledge of the issue). But requires EXPERIENCE which may be lacking in midshipman and junior officers.
- Quality of decision needed: impact or potential outcomes of the action intended.
- Acceptance, implying team members take ownership, follow through and implement, and are not minimally complying. Is decision "good" if it causes conflict and resistance, or require close follow-up (resources) to achieve implementation?
- In some cases – simply making a decision may be more important than what is decided. When differences are not significant, resolve uncertainty and move on. US Grant is reported to have said "If we find we are wrong, we can change."

Methods of decision making.

- Intuitive – relies heavily on association with situations of past experience and recognizing a satisfactory course of action rather than "thinking through" to a best decision. May also tend to action that is "good enough."
- Analytical – gathering facts, data, input and recommendations to derive a best or "optimum" decision.

One model for decision making: the OODA Loop (Observe – Orient – Decide – Act). Devised by COL John Boyd USAF during the late 1950's while at Fighter Weapons School, Nellis AFB, NV, the OODA Loop was initially a way to show fighter pilots how to quickly make decisions in air-to-air combat (dog-fights). It was based on a scenario of two adversaries seeking to vanquish the other. Taken on a broader scale it has gained wide recognition as a sound process for analytical decision making.

- Observe the situation. Assimilate existing information as to situation, status, surroundings; gather additional information when necessary. Ambiguities will often exist and should be recognized; but delaying for 100% of all possible information is often unrealistic and potentially detrimental.

- Orient to the situation. The most important part of the process. Includes estimates, assumptions, judgments in order to figure out and understand the situation. Be open minded, ensure experience or biases do not skew the picture.
- Decide what to do. An immediate action or a longer term plan and action. Be sensitive to alternatives, overall objectives, time and, finally, perceptions that may evolve from the decision.
- Act, implement the decision. Disseminate, supervise execution, monitor results by ensuring feedback. Now the cycle begins again by observation of the effects of the action.

In applying an analytical approach to a decision, recall the elements of Critical Thinking (Chapter 2.0 Principles of Leadership).

There are a number of sources for additional information and insights on the OODA Loop. One readily available reference: Wikipedia.com

3.3 MANAGING AND RESOLVING CONFLICT

Why this is important.

- Conflict in teams is inevitable.
- Successful resolution enhances team performance.
- Unsuccessful resolution or no resolution degrades team performance.
- The leader must use the energies of conflict in a positive manner (towards mission accomplishment) and prevent it from disrupting / eroding team effectiveness.

Conflict occurs when opposing parties have interests or goals that appear to be incompatible.

Causes of conflict.

- Lack communications between individuals (often the most significant reason).
- Strong differences in values, beliefs, or goals.
- Team members (collectively or individually) under stress.
- Tasks or responsibilities are uncertain or appear incompatible.
- Leader's actions appear inconsistent with goals or standards / expectations.

Conflict within a team is not necessarily bad, may be considered as having "positive" potential or "negative" potential.

- Positive normally centers on how to solve a problem or accomplish a task; resolution may lead to improved effort and results, impetus for change, stimulation of critical thinking, identification of underlying issues (and solve the real problem vice an apparent problem)
- Negative typically centers on interpersonal relationships and can lead to decreased communications and cooperation, stress, negative feelings, poor decision making, and reduced productivity.

Potential strategies for conflict resolution.

- Competitive: One (party's) position or outcome achieved over or at expense of another's. Can be termed win-lose or domination. When: Quick or decisive action required, as in an emergency. For significant issues where unpopular actions are required (ex: discipline, cost cutting, enforcing unpopular rules.
- Accommodation: Opposite of competitive, one gives in entirely to position of another. When: After realizing one's position is wrong, to allow a better position to be heard, to show reasonableness,

when harmony and stability are especially important, allow subordinates to make a mistake and learn, build social credit for later / bigger issues.

- Compromise: Somewhere between competitive and accommodation; both get something, both give up something. When: Goal is important but not worth the risk of disruption of competitive resolution, opponents with equal power are committed to mutually exclusive goals, temporary settlement of complex issues, achieve expedient solutions under time pressure.
- Collaboration: A problem solving approach that seeks to integrate concerns of both parties, both sides too important to be compromised.
- Avoidance: Indifference or failing to address concerns of both parties. When: Issue itself is not significant, more important issues are pressing, let people cool down and regain perspective, gathering further information overweighs immediate action, when the current issue appears tangential to or symptomatic of other issues, others can solve the issue more effectively.

Role of leadership in conflict resolution.

- Prepare for negotiation, do your homework: Consider both side's issues, concerns, attitudes, goals and strategies.
- Separate people from the problem: Focus on facts and issues, do not allow own feelings to influence perception of each side's intentions / goals.
- Focus on interests of each side, not the positions.
- Insure good communications, emphasis on active listening.

CHAPTER 4

4.0 REINFORCEMENT OF LEADERSHIP EXPERIENCE

Intent. Skippers and XO's, through one-on-one conversations with individual midshipmen, reinforce the leadership experience gained during OSTS.

Discussion. One of the powerful tools of the experiential learning experience is reflection. Refer back to the discussion in Chapter 2.0 on Principles of Leadership / Reflection.

We recommend that Skippers and XO's make (at least) two opportunities during the course of the OSTS block to review one-on-one with each midshipman in the crew the leadership experience they have gained. The intent is two sessions for each midshipman, possibly one conducted by the Skipper and one by the XO to provide the benefit of two separate perspectives.

We also suggest that one session be conducted during the outbound transit enroute to the remote port, and the second during the return transit and prior to arrival back in Annapolis. These should be separate and distinct from a final end-of-block review that would largely address performance and final evaluation (e.g., FITREP).

The goal is to get each midshipman to self-examine the leadership he/she has experienced, certainly his/her own, and possibly what he/she has observed in his/her contemporaries. Logical points of discussion include application of principles learned in the classroom, things that were successful, things he/she might change in follow-on leadership responsibilities. The Skipper and XO are both facilitators and coaches in these discussions.

4.1 MIDSHIPMAN GOALS

Intent. Midshipmen set goals to achieve during OSTS and then assess their own performance.

Discussion. A principal objective of OSTS is gaining hands-on experience consistent with the overall training mission of the Naval Academy. A set of goals, established by each midshipman, should be used to help realize this objective.

Goals should be SMART.

- Specific – precise, not general statements.
- Measurable – should have a metric by which to judge achievement.
- Attainable – realistic and achievable, while also challenging.
- Results oriented – desired outcome; words like complete, acquire, produce, increase, decrease.
- Time bound – a deadline for completion.

There should be at least two goals and one of the goals should address leadership.

At the beginning of the block, most midshipmen have little understanding of OSTS. It is suggested that statement of goals occur after the 48 hour shakedown cruise and prior to departure for the remote port. This provides some initial experience to provide a basis for meaningful goals. A sample goal sheet that can be used is provided below.

At the end of the block, midshipmen assess their performance compared to their original goals.

OSTS BLOCK CRUISE MIDSHIPMAN GOALS

Name:	Circle one: 3/C 2/C 1/C	Block:	Boat:
		Calendar yr:	
1. **Personal goal:**			
1A. End of block self assessment:			
2**. Leadership goal:**			
2A. End of block self assessment:			
3. **Additional goal (optional):**			
3A. End of block self assessment:			

4.2 GUIDED REFLECTION

Intent. There are two objectives for this section.

- Reinforce leadership perspectives gained during OSTS on-water experience.

- Make a connection between the on-water experience and leadership principles and practices taught during the academic curriculum.

Discussion. The objectives will be realized for midshipmen through evaluation of recent personal experience. The exercise consists of a series of questions intended to recall and define a recent learning situation and promote personal reflection which, in turn, will identify and develop the lessons to be learned.

The Guided Reflection exercise consists of a series of questions / prompts intended to make connections between personal knowledge and experience in a leader development role. Questions are suitable for individual or group-based reflection about a particular incident or about an experience in total. Participants should be as specific as possible in identifying the knowledge factors associated with the experience.

The Guided Reflection exercise is encouraged as an oral discussion during an OSTS block at times deemed appropriate by Skippers / XO's. Examples:

- Following a significant event (good or not so good). Reinforcement of things that went well and why is just as meaningful / valuable as a post mortem on things that went wrong.

- Planned / scheduled check of progress (prior to arrival at remote port may be an appropriate milestone).

Additionally, at the end of each block upon return to USNA and prior to release from OSTS, a computer based Guided Reflection will be completed by each midshipman.

Guided Reflection prompts / questions.

- Describe your position, the general situation, and the outcome of the experience. (This could be single event, or an experience over a more extended period of time).

- Identify and describe the framework, concept, or theory you applied in the experience. Specifically, draw from your education in NL110, NE203, and/or NL310. The table below will refresh you on the range of concepts to which you were exposed in the classes listed in the table below.

- How will this experience help you spot or create opportunities to apply leadership learning in future situations?

- How will this experience help you in the future to develop your subordinates individual strengths, capabilities and or talents?

- Have others commented or reacted to the way that you performed in this event and/or billet? How will you use their feedback to make sense of your experience?

- Reflecting on your development as a leader, which improvements have you made of which you are most proud, and what one area do you feel you need to improve further?

NL110	NE203	NL310
Values	Professional Identity	Critical thinking
Reflection	Constitutional Paradigm	Interactional Framework
Goal Setting	Moral Reasoning	Social perception and bias (Self-fulfilling prophecy, Fundamental Attribution Error, AOR model)
Ownership	Utilitarianism	Bases of Power/Influence tactics
Social Influence	Kant/Moral Duty	Intelligence/Emotional Intelligence
Group development	Stoicism	Motivation (Hierarchy of needs, Expectancy Theory, Operant conditioning, Goal setting, Empowerment)
Self-discipline/motivation	Character and Honor	Group development, norms, and cohesion
Moral Leadership	Natural Law	Leading Teams
Civility	Justice	Counseling and Feedback
		Decision Making
		Conflict Resolution
		Personality Theory

CHAPTER 5

5.0 PRACTICAL APPLICATIONS AND PROGRAM OBJECTIVES

Upon completion of the OSTS summer training program, midshipmen will:

- Recognize the positive contribution of the experience to their leader development as future military officers.

- Be able to articulate in writing the application of a leadership concept learned in the classroom to a specific experience during the summer sail.

- Practice greater skill in reflection about leader experiences (their own and others').

- Think more critically about the factors that affect mission accomplishment.

- Manage risk with greater confidence.

- Improve emotional intelligence, including emotional self-awareness and self-regulation.

5.1 BILLETS AND CREW ORGANIZATION

Intent. Define responsibilities that create opportunities and expectations for leadership and initiative.

Discussion. The intent will be achieved by delegating to midshipman all normal boat (STC) responsibilities (watchstanding is addressed separately in a later chapter). The Skipper and XO are resources and coaches for midshipmen in learning and carrying out their responsibilities, but the expectation is that the midshipmen will "just do it." The Skipper and XO should concern themselves with midshipman skill training, leadership opportunities, coaching, and mentoring. Emergent issues should be assessed by the Skipper or XO, and then delegated to an appropriate midshipman for action. In these responsibilities, there are references to "train" and "oversee" crew members and watchstanders. These, in particular, create expectations for midshipmen to learn and exercise initiative and leadership.

Billet Responsibilities.

- Skipper: The responsibilities of the Skipper of a Navy STC are broad and the same as those of a Commanding Officer as contained in Navy Regulations, except that the Skipper of a STC has no inherent authority under the Uniform Code of Military Justice (UCMJ). Key items from Navy Regulations: "Responsible for the safety, well being, and efficiency of the entire command" and "responsible for safe navigation." From DNAS SOP: "The unique training environment at the Naval Academy requires that command authority be exercised with discretion and in a manner which encourages the development of command and leadership expertise in midshipmen." This is consistent with the intent and recommendations of the Experiential Leadership Initiative. At the same time, Navy Regulations discuss delegation clearly: "Commanding Officer may delegate authority for execution of details, (but) such delegation of authority in no way relieves the Commanding Officer of continued responsibility" (for items quoted above).

- Executive Officer (XO): The XO is second in command and is responsible to the Skipper for execution of daily routine, supervising the crew in making the boat ready for sea, maintaining satisfactory cleanliness and stowage on board including messing, berthing, and the head, ensuring crew members attend intended training and that crew members begin off-shore voyages with a complete seabag. Acts as Senior Watch Officer and regulates liberty for the crew during the cruise block.

- Navigator (NAV): Preparation and presence on board of all required charts, navigation instruments and references; create and maintain up-to-date the navigation plan; train and supervise

performance of the Navigation Team including the underway navigation routine; be aware of currents and predicted weather; train crew in operation of navigation equipment. Responsible for EPIRB, oversee maintenance of deck logs (Off Shore (narrative) and Off Shore (data)), maintain the Navigation Station in an orderly fashion.

- Assistant Navigator (ANAV). Assist the Navigator, particularly in navigation training, supervision of underway navigation performance, underway logs, oversight of chart preparation, and with crew training in GPS, chartplotter, radar, weather fax, VHF and SSB HF radios, and navigation lights.

- First Lieutenant (1LT): Care and maintenance of sails and rigging (running and standing); maintenance of mooring lines, anchors, winches and related equipment, jack lines, sail repair kit; cleanliness and maintenance of boat exterior; cleanliness and stowage of lazarette; preventative maintenance (PM) for deck, sails, standing and running rigging; and train crew in specified deck seamanship topics.

- Supply Officer (SUPPO)): Mess caterer, menu / meal planning; provisioning, storage, inventory and issue of food and drink; inventory of galley gear, cleaning gear, consumables, publications; cleanliness of reefer; cleanliness and condition of berthing; establish boat stowage plan; train crew in the operation of the galley range, propane system, reefer system; and monitor use of propane (safety item).

- Engineer (ENG): Understand operations and maintenance of the auxiliary diesel engine, steering gear and associated equipment; train crew on engine operations; monitor engine operations, fluids, fuel consumption; serve as Fuel, Oil, and Water King; PM for engineering and steering systems; advise Skipper on material readiness of boat; insure appropriate maintenance chits submitted to Cutter Shed. Oversee engine log.

- Electrical Assistant (EA): Monitor batteries, oversee need for charging; train crew on shorepower connect / disconnect and operation of AC and DC distribution systems; lead any required electrical troubleshooting; inventory of electrical repair equipment; electrical system PM.

- Damage Control Assistant (DCA): Inventory, inspect DC equipment including pyrotechnics, fire extinguishers, first aid kit, DC kit, spare Type V life jacket (tech vest) CO2 cartridges/bobbins; inventory, inspect tethers and tech vests; train crew in assembly, maintenance, and use of tech vests; train crew in use of head; prepare responses and train crew for casualties; responsible for safety, hull, and plumbing PM. Responsible for mechanical systems not assigned to Engineer (i.e., fresh water system, head and holding tank, thru-hulls, depth sounder, speedometers, bilge pumps). Serves as assistant to Engineer.

Crew Organization. The recommended organization defines responsibilities and uses terminology common in a small surface combatant.

- Two billets are defined in DNAS Standard Operating Procedures (SOPs), reference (a), as the Skipper and Executive Officer (XO). These billets are filled by the Director, Naval Academy Sailing (DNAS), and can be a Naval Academy Sailing Volunteer/Active Duty Instructor, or an STC qualified 2/C or 1/C midshipmen.

- Seven billets are defined in DNAS SOPs (Navigator, Assistant Navigator, First Lieutenant, Supply Officer, Engineer, Electrical Assistant, and Damage Control Assistant). However, experience has shown that additionally designating an Operations Officer and Bosun are desirable for managing the overall OSTS workload.

- Normally, eight midshipmen will be assigned to an OSTS crew; four upper class and four third class.
  - The two senior midshipmen will be assigned underway watches as Watch Captain.

- The next senior midshipmen will fill the billets of Navigator and Assistant Navigator and, as such, be assigned underway navigation watches in each section.

- The billets of Engineer, Supply Officer, First Lieutenant, Damage Control Assistant, and Electrical Assistant should be assigned to midshipmen other than those serving as Navigator and Assistant Navigator. These assignments should include the Midshipmen designated as underway Watch Captains.

- In determining billet assignments within the crew, two techniques have been used to enhance a sense of responsibility on the part of the midshipmen for their duties.

  - Provide the list of billet descriptions to the crew and answer questions about billet responsibilities. Then have the midshipmen determine billet assignments between themselves.

  - Provide (by email) prior to first crew meeting, billet descriptions and have each midshipman respond with a rank-ordered list of preferences given the next senior Midshipmen to the two senior Midshipmen or Watch Officers will fill the billets of Navigator and Assistant Navigator. Skipper and XO to determine “best fits” and assign billets within current DNAS guidance previously discussed.

At the initial muster, the crew is organized into the following working parties:

- ADMIN Party: Skipper, XO
- SUPPLY Party: XO, SUPPO
- 1LT Party: 1LT, ENG, DCA/AENG
- NAV Party: NAV, ANAV, EA

Further, the working parties will each require help at various times (e.g., the NAV will need “all hands” help during chart preparation, the SUPPO will need help on the inventory, purchasing supplies, stores and storage, and the First Lieutenant will need additional hands to haul out, lay out, inspect, repair and reload sails) and it is the work parties’ responsibility to cooperate with one another – without having to remind them or intervening.

The check list below defines responsibilities and tasks for preparing the STC for deployment. The tasks and responsibilities are all valid. The specific days and times should be adjusted to fit the schedule for a specific cruise block. Tell the crew that they are responsible for accomplishing all the tasks on the check list within specified time frames. This establishes the crew members' individual and corporate ownership of, and accountability for the vessel from the very beginning.

Also distribute the billets such that each department is represented on each watch section. For example, if the NAV is on the starboard watch, the ANAV will be on the port watch. This offers two advantages:

- There is someone on each watch section available and responsible to train and supervise the watch in each specialty. This further enhances peer training, norm development and crew cohesion.
- It facilitates inter-watch competition on navigation, boat handling, maintenance and housekeeping.

During the training period, Skippers and XOs should try their best to allow some time each day for the crew to work on their assigned tasks – but emphasize that we expect them to arrive early and remain late, should that be required to complete the work on time.

SAMPLE CRUISE BLOCK PREPARATION SCHEDULE

NA-____ CRUISE BLOCK - CRUISE PREP SCHEDULE

D-3 OR EARLIER

ADMIN PARTY
- ❖ Collect medical forms
- ❖ Collect room/cell #'s
- ❖ Collect & compile cert matrix
- ❖ Create, post u/way training plan

SUPPLY PARTY
- ❖ Inventory onboard
  - Cleaning supplies
  - Food stores
  - Galley equip
  - Medical kit?
  - LPG Tank(s)
  - Dry, air all living spaces, head
- ❖ Turn on reefer
- ❖ Check/ fill water tanks
- ❖ Optest head; lube w/ veg oil
- ❖ Optest LPG, stove/oven
- ❖ Optest/ TURN ON REEFER
- ❖ Create & post stowage plan
- ❖ Label wet lockers & food

1LT PARTY
- ❖ Shift berth (if req'd) to connect shore power & cool reefer
- ❖ Inventory load-out
  - Sails (restow PESO!)
  - Lines/ gear
  - Anchors
  - Tools
  - Spare parts/ fluids
- ❖ Check fuel tank level
- ❖ Optest engine
- ❖ Optest all nav & admin lights
- ❖ Inventory, inspect
  - Fire extinguishers
  - Flares
  - Kapoks
  - Emergency tiller
  - Bilge pumps
  - BIB / SOP
  - Tech manual

NAVIGATION PARTY
- ❖ Inventory charts
- ❖ Verify all chart changes posted
- ❖ Inventory onboard
  - Publications
  - Offshore log
  - Bearing log
  - Navigation texts

D-2 OR EARLIER

ALL
- ❖ 0745: Muster at boat
- ❖ 0900: Depart Basin
- ❖ 1730 Return to Basin
- ❖ 1900: Muster at Luce
  - Continue chart prep
  - Continue boat inventory
  - Read Standing Orders
  - Acknowledge reading SOP/BIB

ADMIN PARTY
- ❖ Schedule draw times for
  - Pelican case
  - Wednesday WX brief
- ❖ Schedule pumpout, fuel, water times (if required)
- ❖ Optest sat phone, if issued

SUPPLY PARTY
- ❖ Draw Shortages:
  - Cleaning supplies
  - Galley equip
  - Medical kit
  - LPG
- ❖ Accept, stow food loadout
- ❖ Draft menu, stores shopping list

1LT PARTY
- ❖ Inspect & stow
  - Sails(PESO!**)**
  - Lines/ gear (shackles up!)
  - Anchors
- ❖ Inspect all running rigging
- ❖ Inspect all standing rigging
- ❖ Top off extra oil, xmsn & coolant jugs

NAVIGATION PARTY
- ❖ Draw Pelican case
- ❖ Organize nav station
  - Stow charts in voyage seq
  - Load waypoints in GPS
  - Check VHF/ HF for correct channels, operation
  - Optest RADAR
  - Optest Fathometer, knotmeter
  - Determine cruise track based on WX, currents
  - Create PIM
  - Optest VHF, HF, WXFAX

D-1 OR EARLIER

ALL
- ❖ 0745: Muster at boat
- ❖ 0900: Depart Basin for underway training
- ❖ 1730 Return to Basin

ADMIN PARTY
Finalize 48-hour cruise plan

SUPPLY PARTY
- ❖ Brief stowage plan
- ❖ Supervise stowage of stores & personal gear

1LT PARTY
- ❖ Inventory, inspect
  - Flares
  - Tech vests
  - Preventers
  - Reefing lines

NAVIGATION PARTY
- ❖ Training on maintaining
  - Offshore Log
  - Bearing Log
- ❖ Waypoints in GPS
- ❖ RTP training
- ❖ Instruments/ comms gear training
- ❖ Bearing compass training

DAY OF DEPARTURE

ADMIN PARTY
- ❖ Brief:
  - Standing Orders
  - Night Orders
  - Cruise Schedule
- ❖ Brief stowage plan

SUPPLY PARTY
- ❖ Supervise stowage of stores & personal gear

NAVIGATION PARTY
- ❖ Navigation & WX brief
- ❖ Initiate Log once underway

1LT PARTY
- ❖ Rig jack lines
- ❖ Underway prep per SOP
- ❖ Supervise fitting & testing of tech vests and tethers

5.2 WATCHSTANDER RESPONSIBILITIES

Intent. Define responsibilities for watchstanders underway.

Discussion. Responsibilities for underway watchstanders may be more intuitive than billet responsibilities. However, the intent again is to highlight leadership roles, promote initiative and build teamwork among the midshipmen crew. While titles for watches in a sailing vessel may differ from those in a warship, the functions and responsibilities have close parallels.

Some Skippers view the Watch Captain as equivalent to the Officer of the Deck (OOD) aboard a Navy ship. Both are responsible to the Skipper for overall operation, movement, performance and safety of the vessel during their watch.

There are two Watch Captains, each responsible for their own watch section. The primary responsibility of each Watch Captain is the training and supervision of his / her watch section during underway operations. It is also appropriate that the Watch Captain oversee other duties within the boat's routine that are performed by his/her watch section (ex. preparation of meals, clean up after meals).

Similar to the analogy of Watch Captain / OOD, the Helmsman may be viewed as the Conning Officer aboard a ship. The Helm (Conning Officer) directs the movements and propulsion of the vessel and reports to the Watch Captain (Officer of the Deck).

The Navigator/Assistant Navigator has responsibilities similar to the on-watch navigator of a ship (often the Quartermaster of the Watch (QMOW). Both fix the ship's position, make recommendations for ship's movements, and perform other navigation duties.

The expectations for a Lookout are the same in any vessel underway. Every vessel shall at all times maintain a proper Lookout by sight and hearing as well as by all available means appropriate in the prevailing circumstances so as to take full appraisal of the situation and of the risk of collision.

The Sail Trimmer (Grinder or Tailer) is the only position unique to an STC, just as there are unique functional watchstanders in Navy warships (i.e., sonar and weapons). For occasional maneuvers, the Lookout may serve as a Sail Trimmer but primary responsibility must remain as Lookout.

The Navigator and Assistant Navigator are assigned to opposite watch sections.

Watchstander Duties.

- Watch Captain is the direct supervisor of the Navigation Watch, Helmsman Lookout and other members of the watch section, is responsible for leadership, good order and discipline, and adhering to safe navigational and seamanship practices. The Watch Captain ensures STC is operated safely; ensures crew safety (particularly use of Type V life jacket with harness (i.e., tech vests), safety tether and jacklines); oversees performance of individual watchstanders; trains the watch team; initiates immediate actions for casualties; inspects topside, running and standing rigging during each watch; ensures boat is clean, stowed, secured for sea; is alert to weather, shipping, hazards to navigation; insures watch rotation; determines need for and initiate steps for low visibility; ensures timely meal preparation and post-meal cleanup; keeps Skipper informed (required reports and other appropriate information). Reviews logs maintained by watchstanders. Takes charge of other evolutions and tasks performed by on-watch or off-watch personnel of his / her section including coordinating all hands evolutions with the other Watch Captain.

- Navigator/Assistant Navigator: Fix position in accordance with appropriate fix interval; maintain navigation plot consistent with the required rules of DR; make reports of fixes and course recommendations to Helm; monitor radios; perform as radar watch when appropriate; maintain Off Shore Logs (data and narrative). Ensure VHF radio normally operates to scan specified channels; maintain guard on VHF and (when energized) on designated SSB HF frequencies (normally listed in the OSTS

OPORD), keep Watch Captain advised on position relative to intended track (i.e., position of intended movement (PIM)).

- Navigator shall remain a fixed responsibility during a single watch period. Navigator/ANav may train 3/C midshipmen in navigation practices and may assist topside during a watch period, but shall not discharge or rotate his/her responsibility with any other member of the Watch Team unless safety dictates otherwise.

- Helm: Maintain course; ensure proper lookout performance; monitor sail trim; monitor conditions topside and safety of crew; employ standard orders / commands for common evolutions; use and enforce communications format and discipline. Initiate course changes as required for contact avoidance and to mitigate / avoid navigation hazards. Require routine reports of fixes, accuracy, and course recommendations from Navigator. Communicate with Watch Captain and initiate actions consistent with wind velocity, reduced visibility, observed or predicted weather. Employ VHF radio communications to facilitate surface contact avoidance. Determine with Watch Captain actions to be taken in response to radio communications.

- Lookout: Maintain proper lookout consistent with ROR and good practices; report contacts and follow up in standard format (relative bearing, bearing change, range (estimate) and opening / closing, target angle, classification). On a not to interfere basis, assist in other evolutions (example: tack, jibe, reef). Per USCG Navigation Rules – International and Inland (72 COLREGS), Rule 5, every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

- Sail Trimmer (Grinder or Tailer): Adjust trim of sails (mainsail, genoa/jib, spinnaker) consistent with wind direction and course being steered. Assist in other evolutions (i.e., tack, gybe, reef).

5.3 DUTY OFFICER IN PORT

Intent. Define responsibilities for watchstanders while in port.

Discussion. While underway evolutions and skills are the primary focus of OSTS, additional duties and responsibilities exist in port. An in-port organization, separate from underway watch sections, is necessary.

An effective in port organization is particularly important during visits to remote ports when crew members may be ashore and not available to respond to emergent issues.

Security practices while located in remote ports or at anchor warrant a clear assignment of responsibilities.

A Duty Officer for the boat while in port parallels fleet practices to provide leadership and oversight of the in-port routine. The responsibilities of the Duty Officer in port may be considered similar to the Watch Captain while underway.

The Duty Officer does not relieve crew members of duties assigned within their billet responsibilities, rather the Duty Officer takes any immediate actions judged necessary in that crew member's absence. Upon returning aboard, the normally designated crew member takes responsibility for the issue.

It is recommended that a Duty Officer be assigned for each day of a block. If the boat is underway, the assigned individual effectively draws a bye. However, if arrivals / departures from port vary, there is always a clear, pre-determined assignment as Duty Officer. In similar manner, assignment of a Duty Officer during periods moored in Santee Basin will serve to train crew members for in-port functions and routine.

Duty Officer in Port. Responsibilities include the following:

- Duty period: 24 hours.
- If underway, assume Duty Officer prior to mooring on the day assigned. If in port, relieve / assume Duty Officer about 0800 daily.
- Oversee securing boat in slip after mooring (mooring check lists).
- Prior to daily close of business, insure repair chits for known deficiencies are prepared.
- Return boat folder and repair chits to Cutter Shed.
- In the morning, log out boat folder from Cutter Shed.
- Oversee underway preparations (underway check lists).
- In the absence of the assigned billet individual, take any immediate actions judged necessary. Upon returning aboard, the billet holder takes responsibility for the issue.
- Represent the boat and crew in absence of Skipper and XO.

Additional responsibilities outside of Santee Basin (USNA).

- Maintain safe and adequate mooring of boat in the nest / at anchor.
- Carry out designated security inspections and measures.

- Insure continued safe operability of shore power when installed.
- Take direction from Squadron Duty Officer in absence of the Skipper and XO.
- Assume responsibilities of Squadron Duty Officer when directed.

Sample In Port Duty Watchbill Format.

Day	Date	Name	Date	Name	Date	Name

5.4 WATCHSTANDER COORDINATION AND COMMUNICATIONS

Intent. Knowledge and competent execution of the responsibilities of individual watch stations creates the foundation of an effective watchstanding team. But this does not, in itself, make for safe and effective operations. Routine communications and continuing interaction between watchstanders in all situations is mandatory for effective underway operations.

Discussion. The following communications between watchstanders are recommended so that the watch section functions as an integrated team. These should be viewed as minimum expectations as situations can and will create challenges not anticipated during training. A continuing and comprehensive flow of information between watchstanders is expected at all times to ensure safe and competent operations.

Helmsman:

- Advises Nav Watch of intended changes in course (examples: tacks and gybes, maneuvers for contact avoidance, avoidance of shoal water, any other reason).
- Advises Nav Watch of change in overall speed > 0.5 knots due wind velocity, change of sail(s), or point of sail.

Navigator:

- Concurs with Helm on intended changes in course – or recommends an alternative consistent with navigation position and tactical situation.
- Advises Helm and Lookout of nav aids expected to be seen together with characteristics (color and interval) (examples: buoys, fixed marks, lighthouses).
- Advises Helm and Lookout of expected hazards to navigation (examples: bridges of all types, unlighted buoys, fish havens, charted fish traps).
- Advises Helm and Lookout of radar contacts (bearing and range) in order to assist Helm and Lookout in establishing visual contact.
- Advises Helm of radio calls to own boat or radio information of interest (e.g., sécurité calls, weather advisories).

Lookout:

- Reports to Helm all visual contacts when initially sighted (examples: shipping, nav aids, weather).
- Tracks and updates Helm and Nav Watch on the position of visual contacts (shipping and nav aids).
- Reports to Helm and Nav Watch observed hazards to navigation (examples: bridges, discolored water or breaking waves, fish traps, crab and lobster floats, etc).
- Reports to Helm indicators of changing weather (examples: changes in cloud cover and types of clouds, dark areas on the horizon, visible rain, approaching reduced visibility (fog, etc)).

All Watchstanders: Report all sightings and observations that are not understood or may be confusing.

Notes:

1. While there is always a designated Lookout, all hands topside should be alert that all contacts, hazards, and conditions are noted and reported to Helm.
2. Follow-up reports on shipping contacts should include the following information as it is determined: bearing change (drawing left / right / constant), range (closing / opening) classification (ex: merchant, tug / barge, fisherman, pleasure craft), and target angle.
3. Similar follow-up information should be determined and reported for nav aids (specifically bearing change and range (opening / closing).
4. Nav aids should be consistently described in terms of their characteristics (ex: red 2.5 sec) in order to avoid confusion between multiple nav aids.

5. When under sail, particular attention must be given by topside watchstanders to detect and track contacts that may be behind the jib.

6. These examples are not all inclusive. The desired outcome: Active communications between watchstanders in order to function as an effective watch team for safe operations.

Watch relief. Turnover of the watch requires that there be a complete transfer of watch information and status from the individual being relieved to the individual assuming the watch. The following is an example of relieving the helm. Relief of Watch Captain, Navigation Watch and Lookout should follow a similar format.

Individual assuming Helm: "I am ready to relieve you."

Individual being relieved provide a full status of current situation.

1. Sail configuration (ex: mainsail with 1st reef and #3 jib on starboard tack shackle, starboard halyard).
2. Point of sail (ex: close hauled / close reach / beam reach / broad reach).
3. Course being steered, track course, present speed. (Steering 160, track course is 130, making 4 knots). Course being steered may differ from track course (ex: because of wind direction, avoidance of shipping contact). Course being steered may also be referenced to a land based object in lieu of compass heading in some situations.
4. Contact information – visual and radar (bearing, observed bearing change (drawing right or drawing left, or - most important – steady bearing), range opening / closing, and classification (ex: merchant, sailboat, fisherman).
5. Relevant nav aids in sight and characteristics (ex: Thomas Point Light white flashing 6 sec, buoy 2.5 sec red)
6. Any material or system conditions that could limit operations (ex: #2 jib torn / out of service, head lined up overboard).

Individual assuming helm: Repeat back the turnover information.

Individual being relieved: "That is correct" (or restate anything that was incorrect).

Individual assuming helm: "I relieve you."

Individual being relieved: "I stand relieved."

5.5 PEER TRAINING

Intent. Place midshipmen in a leadership role for crew training.

Discussion. The techniques described here have been used to one degree or another by experienced Skippers. They are provided as recommended "good practices" that have produced positive results on at least two levels: effectiveness of training and providing leadership experience. Midshipmen should play an active role in training; that is, provide training rather just receive training. This shift of roles, from receiving instruction (passive) to providing instruction (active), requires focus, thought, review and engagement. Additionally, it appears that midshipmen may accept advice and correction more openly from peers - rather than critique always coming from an authority figure (Skipper or XO). While the pace of training may seem slower using crew members as instructors, it is suggested that overall results are (significantly) improved. The simple term is "peer training".

Evolutions. At the outset of an OSTS block, an immediate requirement is to train the crew to perform a number of basic evolutions. Examples include undocking, docking, tacking, jibing, and crew overboard. A good summary is contained in the Spring Sail Training Plan (included in the Skipper's folder at the start of each block). Logically, every crew member should perform tacks and gybes as Helmsman. This evolution is used to illustrate an example of peer training.

- The Skipper / XO instructs the first crew member on tacking as Helmsman. After one / two / several repetitions and coaching by the Skipper / XO, the helm is turned over to a second crew member.
- The first individual becomes the trainer for the second person; initially instructing his counterpart on the evolution, and then coaching / critiquing the second's performance during repetitions.
- The Skipper / XO retains oversight.
- This sequence of midshipman training shipmate is followed until all crew members have completed tacking as helmsman.
- This practice can be used for additional evolutions as helmsman, or for other positions (ex: Mast in coordinating taking or shaking a reef).

Another technique is role playing for common situations. An example is VHF radio communications with another ship in a contact avoidance scenario. In Billet Responsibilities, the Navigator is assigned responsibility for training crew members in radio operations. Training should include operational use and normal practices, not just "knobology". Training could proceed along the following lines.

- The Skipper / XO would initially review a typical scenario with the midshipman trainer. If possible, ensure the trainer has been on deck for a real world encounter.
- The trainer should then develop a situation (ex: contact (tug / merchant / fisherman) / own course / contact bearing / bearing change / range / target angle / possibly navigation light configuration (a night scenario)). The trainer would describe or talk through the encounter with the crew (or a watch section may be preferable).
- Finally, assign individuals as role players (Helm, Nav Watch, pilot on merchant or tug master as examples) and proceed through the encounter using normal radio procedures, expected terminology and correct radio discipline.)

Within the Billet Responsibilities are several instances in which the incumbent is designated to train the crew in common boat operations that everyone one will perform at one time or another (ex: Supply Officer trains crew in operation of the galley range, DCA trains crew to operate the head). Again, it is appropriate that the Skipper / XO walk the designated individual through the evolution and then require that individual to train each of his / her shipmates (and to follow up if poor practices or incorrect operations are noted).

5.6 STANDARD COMMANDS

Intent. Use standard commands for common evolutions so that (1) Operational communications are short and clear, (2) Actions are understood quickly by all involved, and (3) Teamwork is enhanced.

Discussion. Midshipmen have little experience giving orders and directing others, particularly OSTS crew members (normally new 3/C who completed plebe year just days / a few weeks beforehand). Throughout plebe year, they took orders and were directed in many situations, that direction often given closely and in detail. The paradigm shifts quickly and dramatically when the expectation becomes taking charge and directing / leading / coordinating actions of shipmates. They are not used to directing or comfortable doing it. Using standard commands for common and repetitive evolutions supports developing the ability to lead and confidently direct the actions of a team.

Standard terminology, phrases, and orders are common in all military organizations. Through training, crew / team members understand the actions and reports implicit with each order. Standard orders reduce the time and words to communicate a set of actions, mitigate potential for misunderstanding and improve command and control.

Standard commands in the STC normally have two parts: (1) A preparatory command that positions personnel and completes preliminary actions; and (2) An initiating command that starts the evolution. The initiating command is understood to include actions for performing the evolution that are taken without further specific direction.

This Guide contains recommended standard commands for evolutions described and a summary of the evolution. The specific procedures for performing each evolution are contained in Chapter 3 of the Boat Information Book (BIB). The BIB is the authoritative directive for all evolutions.

Standard Commands.

1. **Departing Santee Basin (USNA)**

   Use VHF Channel 82A to hail Santee Basin Control:

   "*Santee Basin Control, this is "BOAT NAME", Request permission to depart the basin, XX souls onboard, estimated hours out of basin "HRS" + "MINS", OVER*" -- (i.e., 2+30 for 2.5 hours)

   Use VHF Channel 12 to issue sécurité call:

   "Sécurité, sécurité, sécurité*, this is "BOAT NAME". Be advised that we are exiting Santee Basin"*

2. **Returning to Santee Basin (USNA)**

   Use VHF Channel 82A to hail Santee Basin Control

   "*Santee Basin Control, this is "BOAT NAME", Request permission to enter the basin, XX souls onboard, OVER*"

3. **Tacking**

   "Ready About" – preparatory.

   Two (2) reports required from crew: "Port (sheet) ready," "Starboard (sheet) ready."

   "Helm's a-lee" – initiating (smartly). Without further orders:

   Helmsman put helm over.

Working jib sheet – casts off as sail starts to luff. Reports "Break".
Prior lazy jib sheet – takes on sheet as sail comes through, trims jib to new course.
Main Sheet - no action required if going from close hauled on one tack to close hauled on opposite tack.

"On course"
Helm advises crew that he is on new course.
Crew makes final adjustments to mainsail and jib trim.

4. **Gybing**

"Prepare to gybe" – preparatory.
Note: Terminology of the preparatory command for gybing is completely different (as compared to tacking) so that potential for misunderstanding is minimized.
If preventer is rigged, Main Sheet clears the preventer and reports "Preventer clear."
Three (3) reports required from crew: "Port (sheet) ready," "Starboard (sheet) ready," "Main Sheet ready." "Main Sheet ready" also indicates preventer line is clear.

"Bearing away" – initiating. Without further orders:
Helm put the helm over (slowly).
Working jib sheet – may take on sheet as sail loses power, then casts off when sail luffs. Reports "Break".
As wind approaches 150 to 160 degrees relative, Helm orders "Center the main."
Main Sheet brings mainsail to near boat centerline. *On a cautionary note, ensure that the main sheet does not foul the binnacle guard during the actual gybe*.

"Gybe HO"
Helm advises crew that mainsail is about to cross boat centerline.
Prior lazy jib sheet – takes on sheet to trim sail to new course.
Main Sheet – eases mainsail to trim sail to new course.

"On course"
Helm advises crew that he is steady on new course.
Crew makes final makes final adjustment to mainsail and jib trim.
If new course brings wind to greater than 120 relative, crew rigs the respective preventer line.

5. **Reefing**

"Prepare to take the first (or second) reef" – preparatory
Four reports (4) are required from crew: "Mast ready," "Halyard ready," "Reef ready," "Main Sheet ready."

"Take the first (or second) reef" – initiating. Without further orders:
Main Sheet: Frees boomvang to allow boom to rise. Eases main sheet until mainsail luffs.
Mast - coordinates the following actions:
(1) As main sheet is eased, Halyard lowers main sufficiently for Mast to engage reefing cringle on horn.
(2) As main halyard is eased, Reef removes slack from reefing line (but does not grind).

(3) Mast guides mainsail luff down, engages reefing cringle, reports "Made."
(4) When "Made" reported, Halyard raises the mainsail to achieve proper luff tension.
(5) Mast monitors luff tension. When proper, reports "High" and Halyard ceases grinding.
(6) When "High" reported, Reef begin begins to grind in the reefing line.

Main Sheet eases main sheet to allow boom to rise as clew is brought down to boom. Insures boomvang remains slack.

Main Sheet reports "Made" when clew is snug to boom.

When "Made" is reported, Reef ceases grinding.

Main Sheet then trims main sheet and boomvang for existing course and conditions.

Crew puts sail ties in place at reef points. Sail ties must not be wrapped around the boom but under the foot of the sail. This prevents ripping of the sail. An "earring" (sail tie) can be tied through the reef clew around the boom if the reef will be place for a long period. This minimizes wear on the reef clew.

6. **Shaking a Reef**

"Prepare to shake the reef" (or) "Prepare to shake the second reef" (if retaining the first reef) – preparatory. Crew removes sail ties from reef points and reef clew earring if previously installed in mainsail. Note that removing a clew earring may take a few minutes and the use of a marlin spike if it's been there awhile.

Four reports (4) from crew required (same as taking a reef): "Mast ready," "Main Sheet ready," "Halyard ready," "Reef ready." Indicates sail ties have been removed and crew is ready.

"Shake the reef" (or) "Shake the second reef" –initiating. Without further orders:

Main Sheet: Frees boomvang (both sides) to allow boom to rise. Then eases main sheet until mainsail luffs.

Mast coordinates the following actions:
(1) As main sheet is eased, Halyard eases main halyard just enough for Mast to disengage the reefing cringle from the horn.
(2) As main sheet and halyard are eased, Reef eases reefing line(s) and insures reefing lines(s) remain slacked.
(3) Mast disengages reefing cringle from the horn, reports "Clear."
(4) At report of "Clear," Halyard tensions and then grinds main halyard to raise mainsail.
(5) Main Sheet eases main sheet to keep sail luffing as mainsail is raised. Insure boomvang remains slack. Insure the reefing line(s) run free as mainsail is raised.
(6) Mast reports "High" when proper mainsail luff tension is achieved.
(7) When "High" is reported, Halyard ceases grinding.
(8) Main Sheet then trims main sheet and boomvang for existing course and conditions.

7. **Change of Headsail**

"Stand by to change to number (designate new sail) jib. This will be a tack / same tack / bear off change" – preparatory.

Helm may elect to start engine to assist in maintaining steerage way during the sail change.

Crew breaks out new sail, brings it on deck, hanks on new jib beneath the current sail.

Jib Sheet shifts lazy sheet from current jib to new sail (for tack change (or)

prepares 3rd sheet for same tack / bear off change

Four (4) reports required: “Jib Sheet ready,” “Luff ready,” “Foredeck ready,” “Halyard ready.”

“Ready about, change to number (new jib)” (for tack change) – initiating. Followed by “Helm’s a-lee.”

(or)

“Change to number (new jib), holding course” (for same tack change) – initiating.

(or)

“Coming off, change to number (new jib)” (for bear off change) – initiating.

Without further orders:

When sheet is eased, Halyard lowers the jib.

As jib is lowered, Luff removes hanks from head stay.

As jib is lowered, Foredeck gathers old jib on deck, stretches sail aft and to windward.

Jib sheet insures sheet is attached to new sail. Reports “Sheet made.”

When all hanks removed from head stay, Luff shifts halyard from prior sail to new jib. Reports “Halyard made.”

When “Halyard made” is reported, Halyard raises the new jib.

When new jib luff tension is correct, Luff reports “High” and Halyard ceases grinding.

When “High” is reported, Helm completes the tack (for tack change) (or) returns to original course (for bear off change).

When “High” is reported, Jib Sheet trims the new sail to intended course.

8. **Crew Overboard (COB)**

Anyone seeing a crewmember go overboard, immediately alert entire crew by shouting “Man Overboard, Starboard (Port) Side”. Becomes Pointer, keeps eyes on the person in the water.

Helmsman repeats initial report of “Man Overboard, Starboard (Port) Side.” – preparatory.

Then announces and commences recovery actions – initiating (i.e., “Quick Stop” or “Figure 8” recovery method).

Crew mans positions for recovery and reports “ready.” Seven (7) reports expected from crew: “Pointer manned,” “Nav ready (after entering position in chart plotter),” “Main Sheet ready,” “Halyard (jib) ready,” “Foredeck ready,” “Recovery (boat hook or throw bag) ready,” “COB/MOB ready (contingency to deploy Lifesling or MOB pole if contact not achieved on first attempt).”

Helm directs actions to bring boat back alongside person in the water.

“Lower the jib” – as stern approaches wind and jib is unloaded.

“Gybe HO” – alerts crew the stern is coming through the wind.

“Hardening up” – Helm bringing boat into wind to commence approach to victim.

“Port side (or starboard side) recovery” – designate which side to take man alongside.

“Ease / take on the main sheet” – use the mainsail to adjust speed approaching victim.

9. **Linehandling**

Breast lines: Lines that are nominally perpendicular to the pier / centerline of the boat and hold the boat to a pier. For an STC alongside a pier or dock, the bow line and stern line are normally breast lines.

Spring lines: Lines that tend fore and aft and limit boat fore and aft motion. For an STC, the forward spring and the after spring lines are passed through the amidships chock, one leading forward and the other leading aft to the pier / dock.

"Stand by your lines": Take station at all lines and stand ready for orders.

"Take lines in hand": When moored, remove lines from cleats / winches / chocks, and then maintain tension so that the boat does not move.

"Cast off (designated line)": Toss / pass the line ashore.

"Take in (designated line)": Bring the line on board.

"Ease": Allow line to slip and boat to move with negligible tension.

"Slack": Remove all tension, allow line to sag.

"Check": Keep moderate tension on the line, but allow it to slip. Normally used to slow movement of boat when entering slip / coming alongside a pier. Also used in adjusting position of boat in slip / alongside pier as Helmsman uses propulsion to achieve desired position.

"Tension": Take / keep all slack out of line, maintain tension on line without moving the boat.

"Take": Pull in on line so as to move boat in the desired direction.

"Hold": Place turn(s) on cleat to prevent any slipping of line.

"Double": Remove eye of line from cleat on pier, pass line around cleat on pier, then take the eye back aboard to same boat cleat. Tend bitter end on the boat cleat. Creates two bights holding boat to pier but the line is able to slide around the pier cleat thereby equalizing strain on both bights.

"Put over (designated line)": Toss eye of the line to the pier at the location / cleat where it is to be secured.

"Put down (designated line)": Secure the eye of the line on the designated pier cleat.

5.7 MEAL PLANNING

Intent. Good food is a fun and essential part of sailing. Whether you are going out sailing for a weekend, a week, a month or a year, someone has to plan what the crew is going to eat, shop for it, store it, fix it, serve it, and then figure out what to do with the trash.

Discussion. Planning, shopping, stocking and maintaining an inventory of your stores are loved by some and dreaded by others. Usually the designated Supply Officer (SUPPO) has the responsibility to provision the STC. It is also each crew member's responsibility to assist the SUPPO with the meal planning and provisioning.

The key to nearly every successful meal is in the advance planning and subsequent provisioning. Some people plan exact menus for each meal – others take a more casual approach. A lot depends on your crew's dining style. An offshore sail eating just hot dogs, pizza bagels and snack bars is just not appropriate and does not help morale particularly if the weather is marginal. A hot meal is always a great morale booster.

First, ask what the crew members like and dislike. Be particularly mindful of food allergies. Next consider what you have to work with. What are the limitations of the STC? What cooler and dry storage space is available? How many burners can be used at the same time? Do you really want to use the oven and heat up the cabin? What kind of cookware is on hand? How much time do you want to spend preparing and cooking? It is also a good idea to have a master list of basic food and non-food items to either store on the boat or keep in a large plastic container.

The next step in the planning process is to lay out meal plans for the voyage and then estimate what quantities will be needed. A sample Daily Meal Planning table is provided below.

For example, every day each person will need 1 breakfast main dish, 1 lunch main dish, 1 dinner main dish, 3-4 beverage servings, 3 grain servings, 1 starch serving, 1 vegetable serving, 1 salad serving, 1 dessert serving, and 2 snack servings. Multiply the number of persons on board and the number of days for the sail and you have the start of a provisioning list.

Breakfast can be a very simple self-service meal. Suggestions include individual fruit cups or fresh fruits, juice, yogurt, dry cereal, breakfast sweet rolls, or cold cuts and croissants with jam. You can vary that with eggs, bacon, French toast etc. depending on the sea state and your willingness to prepare something more elaborate. Look for pre-cooked bacon that can be stored without refrigeration. Another handy product for breakfast are "egg-beaters" - you can store in the reefer.

Lunch can be the typical fare of sandwiches with chips, potato salad or slaw, baked beans, etc. Consider wraps, mini pizzas and some favorite appetizer recipe for a change of pace. If it is cold and raining, a cup of hot soup usually hits the spot. Be sure to keep an extra package or two of crackers for rough weather. Depending on crew or guest preferences, fresh fruit, cookies, or mini-candy bars are great desserts.

Dinner is usually the high point in the day and should give the crew a really satisfied feeling as well as balanced nutrition. Planning ahead and using a mix of easy to prepare and pre-cooked food takes most of the work out of the galley. Packaged salad, bread and butter, and a side of vegetables can accompany any main course.

Snacks between meals and during watches are critical for energy and morale. Individually packaged snacks such as candy bars, cookies, and trail mix stay fresh longer. Stock some of each crew's favorite goodies and keep them in a "snack drawer" where they can help themselves.

Finally, have plenty of drinking (potable) water onboard. For planning purposes assume that each crew member needs 2 gallons of water per day – 1 gallon for drinking, and 1 gallon for food preparation and cleanup. The ready mix beverage pouches (i.e., Crystal Light, Gatorade, Propel, etc.) also come in many types and flavors. This helps flavor the water and keeps the crew drinking to stay hydrated. Add these

beverage “powder sticks” to the snack drawer.

Stowing Provisions. Freeze everything you can in advance, including milk, butter and juice. When you buy fresh produce, don’t put them in the reefer – they will keep just fine for several days if you don’t. The use of “green bags” can extend the life of produce. Use a separate cooler just for beverages to limit the number of times the crew opens the reefer lids.

Trash. Finally, don’t forget the garbage. Remove as much of the food packaging as possible before stowing it. Do not buy the individual plastic water bottles. No glass bottles or containers should be used onboard. Instead buy big jugs of drinking water and have the crew use reusable drinking bottles. This practice alone will cut the boat’s trash generation by a factor of 3. When at sea, food scraps feed the fishes, and everything else gets crushed and bagged for proper disposal on shore.

FORMAT FOR DAILY MEAL PLANNING

Person Assigned	Breakfast (0600 - 0700)	Lunch (1100 - 1200)	Dinner (1600- 1700)
Cook:			
Clean up:			

Meal

Entrée (protein)			
Vegetable			
Starch			
Dessert (Optional)			

5.8 TRAINING NEW SKIPPERS AND EXECUTIVE OFFICERS

5.8.1 RICK ROBEY – SKIPPER INSTRUCTOR

I had the opportunity to conduct Navy 44 Familiarization Training for a new group of OSTS Skippers and XOs onboard NA-33 INTREPID.

One of the insights that came to light when I started working with my crew was that only 2 of the 8 crew members had any significant military experience, let alone Naval service. All were very seasoned keelboat sailors (both cruisers and racers), enthusiastic about supporting Naval Academy Sailing, and were successful professionals that included a retired high profile lawyer, a retired medical doctor and published author, PhD finance professor, a psychologist, a retired business executive, and a military medical doctor.

The professional mix of my crew made me realize for the first time that not all of our volunteer Skippers and XOs have the same baseline knowledge and experience that most of us take for granted being career Naval officers or seasoned Naval Academy Sailing coaches.

My task was to not only conduct Navy 44 familiarization training but to also train this new group of adult volunteers on how the Naval Academy Sailing program trains its midshipmen, particularly in the area of leadership. The Experiential Leadership Guide provided that structure that I needed to not only educate these new Skippers and XOs on the Navy 44 but also provide the fundamentals of why Naval Academy Sailing teaches the midshipmen the way it does.

This Experiential Leadership Guide proved to be an invaluable tool to help frame up the goals of OSTS for my assigned crew that did not have the typical Naval Academy or even Navy Sailing background. I had to get across to each crew member that the Naval Academy uses Navy 44 sailing as a vehicle to train our future Naval Leaders leadership. Sailing is simply the byproduct of this Naval Academy program.

The major challenges I observed for our new non-military volunteers to fully comprehend during this familiarization training were:

- Naval terminology
- Command presence
- Standard commands

The key areas of the Experiential Leadership Guide that I used with my crew to overcome these challenges were:

- Principles of Leadership to include reflection, group dynamics, critical thinking and personal goals.

I initially had a lot of group dynamics particularly with “storming” as the group went through its four phases of development – forming, storming, norming and performing.

- Billets
- Watch Responsibilities
- Standard Commands
- Lessons Learned

This Experiential Leadership Guide is a valuable tool to every OSTS Skipper and XO to provide structure during the OSTS summer cruise to provide leadership training and opportunities for the midshipman crew. In addition, as a side benefit, this guide will also provide our volunteer Skippers and XOs a reference tool they can refer to as they conduct the summer cruises. In the end, every member of Naval Academy Sailing -- staff, volunteers and midshipmen – will be served well by this leadership initiative.

5.8.2 DICK LUNSFORD – SKIPPER INSTRUCTOR

We conducted a spring training cycle for prospective midshipman Skippers and XOs (Blue crew). This training differs from training new volunteers in that, while the candidates' overall (lifetime) leadership and sailing experience may be less, they have experienced an OSTS training cruise on a Navy 44 Mk II the previous summer. Thus they were generally familiar with the vessel, its systems and underway procedures, as well as what to expect of the upcoming cruise block. The midshipman candidates had also had the opportunity to attend both the actual leadership classes (as part of their curricular studies) and the Experiential Leadership lectures this spring. However, this training cycle was also considerably shorter: a total of 4 afternoons -- spread over three weeks -- and an overnight "down and back" run.

One of the challenges that go with working with such a crew is that their knowledge base is spotty. A crewmember may recall some evolutions well; others, less so or not at all, either through forgetting or because he/she had not learned them on their OSTS youngster cruise. The result is that all evolutions must still be reviewed.

However that challenge - the crew's varied experience on the previous summer cruises - creates a golden opportunity to employ peer training. It's been my experience over the time I've worked as a NASS volunteer that the very best instruction is peer-to-peer: the instructor learns to instruct and the novice feels peer pressure to master the subject, if only to keep up with his classmate. From the initial orientation, we tried to assess each of the crew's skills, and informed the crew that part of their evaluation as potential skippers and XOs is how well they trained their shipmates. Another useful device I've used to encourage peer training is to duplicate the training matrix we use for the Certification of Readiness for Sea report prior to departure on a block. I ask each of the crew to mark each task green, yellow or red, depending upon his confidence in his ability to teach it. I then challenge each to find a shipmate who knows the subject and ask him to help him get up to speed on any "yellow" or "red" entries.

I also asked each of the crew to rank order his or her preference for billet (engineer, first lieutenant, etc.) before the block started, that we might assign billets on the very first day and require thereafter that the engineer, navigator, 1st LT et al. train their classmates and supervise the ship's work in their respective areas (engine checks and maintenance, daily weather and navigation briefings, rigging and sail maintenance, etc) throughout the training. We subsequently rotated trainers daily, assigning them responsibility to conduct the training, while Tom, Rich and I tried to simply set the standards, supervise the process, provide demonstrations where needed, correct where needed and add "sea stories" to emphasize points.

For the overnight, we add the challenge to the navigation team to:

- Supervise the watch sections' navigation and log keeping -- using only visual navigation; no GPS – visual fixes and DR only except as noted below; and,

- Selecting, based upon wind, current, VMG, etc. as the evening progressed, when to turn around so as to arrive at Santee Basin by 0700, plus or minus 15 minutes.

We turn on the GPS at each watch change to compute the error in the off-going watch's DR and give the on-coming watch an initial fix. This instigates competition between the watch sections for the smallest error in bearing taking, plotting and DR during the course of a watch.

Lastly, we reminded all hands that a skipper's responsibility is not done until the vessel is ready to go to sea again. No one leaves without pumping out, thoroughly cleaning the boat, filling out maintenance chits, tricing up the racks and turning in or properly stowing all sails and gear after returning from a cruise (even an overnight). This is critical, since all last summer the boats returned from a block on Thursday or Friday and begin a new block on Sunday.

Throughout, we placed our emphasis on pushing the midshipmen's transition from being simply individual crewmembers with individual skills to understanding the balance of simultaneous activities necessary to accomplish all the work that has to be coordinated simultaneously to keep a vessel safely and efficiently

underway. We stressed that their real challenge is to learn how to organize a crew's (or a watch section's) individual actions to achieve and maintain that balance throughout a voyage, and to constantly think "one or two evolutions ahead of the boat" in order to keep the work going smoothly and avert chaos.

This Experiential Leadership Guide is a valuable reference for leadership training techniques that reinforce the midshipmen's classroom leadership instruction in the same manner that we reinforce their navigation instruction once underway.

5.8.3 BILL ERICKSON – SKIPPER INSTRUCTOR

We conducted the spring training cycle for prospective midshipman Skippers and XOs (Gold crew). I found it most valuable because I was able to express thoughts in terms that the midshipmen were already familiar with. For example, I used to find it difficult to identify with slackers---but now just by using the term "social loafers" everybody understands what I mean and nobody gets offended.

Also, using standard commands, and knowing that other skippers are using them too, makes the training all the better. I once had a mid transfer to my boat after the first week of training and I was flabbergasted that he didn't know how to trim the sails properly while gybing. Hopefully, that kind of thing won't happen in the future. We all drill and plan in order to be prepared and to handle unexpected events. Whatever we can do to standardize training helps raise the bar and improves the program.

Finally, my own preparation as a skipper is now accomplished more smoothly and hopefully that will translate to a meaningful and enjoyable cruise for the midshipmen.

CHAPTER 6

6.0 LESSONS LEARNED

Intent. Learn from actual experience.

Discussion. Specific events are a valuable resource for Skippers and XO's. The stories attached are actual happenings and are examples of situations that may be encountered. While it is doubtful that you will face an identical issue, the discussions here demonstrate actions and principles that may be useful in addressing challenges and problems that most certainly will arise.

The term "case studies" is used here in a very general sense to describe situations and on-water events. They are presented as first person experience but without third party analysis or comments that are typical of case studies in the academic world.

Skippers and XOs, past and current, are encouraged to share challenging experiences by submitting similar case studies as presented below. Format is not important, use whatever best captures the situation. One event is appropriate for each submission and they should be short while still conveying a full description of the situation. A maximum of two pages is desirable but not absolute. Please submit any "new" case studies to the Director, Offshore Sail Training Squadron for consideration in a future edition of this leadership guide. Goal is to keep these case studies fresh and relevant to OSTS.

The goal of these case studies is to provide the Skippers and XOs some relevant "sea stories", other than their own, and lessons learned that can be discussed among the midshipmen crew during the summer cruise. These case studies can also be used to start a conversation among the crew during the mid-watch or any other watch for that matter.

Case Studies

6.1 REFLECTIONS OF A MIDSHIPMAN SKIPPER (USNA)

It's been roughly five months since I moored COMMITMENT NA-32 in Santee Basin for the final time on my final cruise as a Midshipman in the Off-shore Sail Training Squadron (OSTS) program. I can no longer remember each distinct day of my voyages, what items needed to be fixed below decks, or even the first and last names of each member of my crew. Come to think of it, I can't even remember the exact names of all the equipment topside. The good news is, however, that the real value of the OSTS program can't be found in an academic understanding of sailing, the number of miles sailed, or the speed of the boat. Instead, my three summers spent sailing with the OSTS program as a crew member, XO, and Skipper of an all midshipman crew taught me invaluable lessons about a far more important topic, leadership, and in a way that no other training program can replicate.

This is all because OSTS is a culmination of three fundamental leadership challenges: the charge to teach a complex art to inexperienced subordinates in a short amount of time, a demanding mission with the potential for real consequences, and the need to accomplish a mission without overbearing directives or formal job descriptions. Simply put, no other program at the Naval Academy is more genuine, and it deserves a more thorough appreciation for the three fundamental challenges it creates.

When I entered the Naval Academy in 2007, I had no sailing experience whatsoever. Then, like every midshipman during plebe summer, I was put on a 26 foot sailboat for an hour of basic sailing three or four times over the course of two months. Needless to say, this created more questions about sailing than it did answers. However, I would not answer these questions until a full year later when, out of an interest to try something different for summer training, I asked for OSTS as my Third Class ProDev Summer Cruise. It was then that my sailing career truly started.

Over the course of four weeks, I did my very best to learn what to do, the vocabulary to describe what I was doing, and finally why I was doing what I was doing. I remember only reaching this third tier of understanding about the most basic of tasks during my summer as a crew member. However, what still amazes me today is exactly how much I have come to know about sailing and how much more I have yet to fully grasp despite XO and Skipper tours the subsequent summers. Simply put, it seems every time I reach a desired level of understanding I find more and more to learn, and I am sure this will always define my relationship with sailing. But herein lies the challenge: if it has taken me 12 weeks of dedicated summer training along with months during the academic year to reach some level of proficiency in sailing, how am I, a midshipman Skipper, to teach a totally inexperienced crew the art of sailing to the level where we can safely transit to Newport, R.I. in less than a few weeks?

The answer is that it takes organization, dedication, and a grounded understanding of what I am teaching, all of which are coincidentally the backbone of good leadership. Specifically, I needed to create a training plan, diligently execute this plan, and then demonstrate my technical proficiency in order to develop a positive and professional mentor-student relationship onboard. Moreover, these same leadership lessons could not be learned nearly as well in an environment that wasn't as complex or nuanced as sailing. Thus, the OSTS program, by virtue of being framed in the sailing environment, demands intensive and active leadership training, a claim that few other programs can make. However, all of this training, whether it was leadership development for myself, or the technical training for my crew, was also intensified because our training culminated in an actual four day voyage in the open Atlantic on a forty four foot boat, a daring venture at best.

At the Naval Academy, most training environments culminate in a graded evolution that incorporates all of the lessons learned throughout the course of instruction. However, most final graded evolutions have no direct negative consequences. OSTS, on the other hand, culminates in a four day voyage out in the Atlantic Ocean that comes with no guarantees, especially when it comes to rudder cables.

(*Editor's note*: *This midshipman Skipper and crew sailing in COMMITMENT had the rudder casualty described later in Section 6.13. He led immediate casualty actions and then ashore in Freeport, NY, supported repairs that restored COMMITMENT to full operation. Readers should review the Skipper's casualty to understand his experience and place his reflections here in context.)*

There was nothing contrived about snapping a rudder cable. No one could call a “training timeout”, nor were we guaranteed to sail away from the incident without damage to the vessel or serious injury. Simply put, failure to perform well and correctly under pressure was all that stood between this incident being an inconvenience and being a serious emergency.

Thankfully, everyone was able to look back on the ordeal and laugh at its excitement and drama. However, this is only due to the exemplary performance of all aboard, and by no means was this result reached by accident. There was real danger with real consequences, and consequently, I will likely never forget the lessons I learned about leadership that night, or in the ensuing months of review and reflection; and no, such a meaningful training scenario cannot be mimicked without the genuine challenge and risks associated with the realities of skippering a sailboat on the open ocean.

Lastly, and most importantly, I can proudly say that I have never once been told how to do my job as XO or Skipper. Now this does not mean I was not given pointers and suggestions, as well as excellent role models to base my leadership style on. However, I could skipper my crew as I saw fit, so long as the mission was accomplished safely and completely. Compare this to academic year leadership training, and the importance of this becomes obvious.

During the academic year, I have held multiple billets, each with their own unique leadership challenges. However, I have always been given very precise directions on how to do my job, and because of this, have gained only minimal leadership experience from these training evolutions. Simply put, if I am not granted the leeway to fail, I cannot possibly learn the lessons that are best learned by falling short. Thus, the fundamental difference between OSTS and other leadership training environments is uncovered: failure IS possible and expected in the OSTS program, and it is always accompanied by genuine consequences that are inherent in sailing on the open ocean. However, these failures are always used as a teaching tool and thus the full spectrum of leadership can be learned.

In retrospect, I must admit that all training is what one makes of it. However, the OSTS program’s willingness to expose Midshipmen to the naturally complicated art of sailing, genuine consequences, all with the freedom to fail and learn from one’s mistakes are what make the OSTS program as rewarding as it is. Thus, I will always maintain that no other leadership development environment on the Yard is inherently more enriching than the OSTS program; it is leadership training at its finest.

6.2 REFLECTIONS OF A CADET SKIPPER (USMA)

"At sea a fellow comes out. Salt water is like wine, in that respect" - Herman Melville

I walked onto the Army Sailing Team in 2008 without ever setting foot on a sailboat. I joined on a whim and never would have guessed that my team and the connections I made would become the definition of my 47 month experience at West Point. My very first race was the invitational Shield's Cup Regatta held at the United States Naval Academy. Army Sailing took last place that year, a dismal finish that many on my team would rather forget. However, with that brief taste of sailing Navy 44s, I got hooked. I started to dedicate my free time to learning, practicing and perfecting the craft. With the help of my coach, I also made significant connections with the sailing program at the Naval Academy that helped me develop as a sailor and Cadet-coach. When I arrived at USNA in January of 2010 on an Academy Exchange, I somehow convinced members of the Naval Academy to let a West Pointer teach a group of Midshipmen how to sail. Shortly thereafter, I was assigned to the OSTS program: a three week sail to Newport, RI along with eight Midshipmen. A month before I returned to West Point, I confidently gave the last command to make down the lines aboard NA-25 Tenacious. Retrospectively, I am able to identify four major facets of leadership that were developed and/or strengthened though the OSTS program: mentorship, experience, new knowledge, and the ability to reflect. These aspects combined with the challenging environment of life at sea provide Midshipmen a real-time command laboratory that strengthens the foundation for life-long leaders.

The first and most influential aspect of the OSTS experience is mentorship. From the beginning of the program until the last stern line is set, there are multiple chances to adopt a mentor. Throughout my time in the OSTS program, my mentor was COL (Ret.) Dick Lunsford, a graduate of Virginia Tech and former West Point Instructor. Although he is a sailing favorite at USNA, he has always been supportive of the Army Sailing Team and often dedicated his weekends to help coach and train our crew. Mentors like COL Lunsford help support the Naval Academy's mission to develop Midshipmen morally, mentally, and physically by enhancing their learning opportunities. My mentor helped me become introspective with my experiences at both Navy and West Point. He also helped me synthesize my own conclusions about leadership challenges I encountered and made sure I came away from each experience with a lesson learned. One of the most significant lessons COL Lunsford taught me is the idea of "the loneliness of command". This refers to the second and third-order effects of decisions. At sea or on land, leaders are charged with the duty of making responsible and educated decisions that are not always comfortable for the crew or the leader. It is here, in the area between doing what is needed and what is wanted, that the leader will feel the loneliness of command. Lessons like this can only be understood through shared personal experience. Mentors like COL Lunsford are an invaluable element of the OSTS program because they reflect what it means to be a leader in our current operating environment and promote mentorship to those they guide. With a cycle of great mentors developing future mentors, generations of leaders will continue to be inspired.

Following mentorship, experience is the second most important aspect of leader development. Over the course of our 15 day sail, my crew and I were tested a number of times by the sea and the weather. One such incident occurred about seven miles off the eastern coast of Block Island, RI. Just as I was relieved from my nightly watch, a weather system started to move in. I retired to my bunk and barely shut my eyes before I was awoken by a member of the crew yelling, "Rhys, Nick is on the bow and he needs your help!" Instinctively, I grabbed my foulies, forgetting my boots, and ran onto the deck. When I breached the passageway, the wind was howling and the skies had opened up. I quickly surveyed the scene and spotted Nick's headlamp on the bow. Nick was lying on the deck on top of the number four jib sail, struggling to stay in control of the situation (and on the boat, for that matter). The force of the wind, peaking at about 45 knots, caused the bow of the boat to round up into the breaking swells. I had to react immediately to secure the safety of my crew. Because I had little time to think, I relied heavily on my training and let my muscle memory take over. I quickly moved to release the jib halyard and fetch the sail ties to secure the flailing sail to the deck. After the sail was down and the crew was accounted for, the reality of the situation sank in. Months later, I learned that I had executed Recognition Primed Decision making. I recognized the situation from the hours of training and classroom exercises and was able to make a quick decision based on the circumstances. This set of circumstances validated the OSTS

training program for me. From that point forward, I was confident that my training would get me through any situation at sea. While the OSTS program could not possibly teach you how to react in every instance, it does teach you how to approach a situation calmly and objectively, how to troubleshoot, and how to develop an appropriate course of action. Though not officially, the teaching method of OSTS inculcates a deliberate problem solving process that is valuable in many circumstances for any military leader.

New knowledge is the next important aspect of the OSTS program. The OSTS program's training philosophy is derived from military decision-making and training programs that are in current operational use. It provides a basis of knowledge for Midshipmen that will follow them into their military careers. This knowledge extends beyond traditional skills like plotting, engineering, and watch standing. It delves into the core values of leadership by placing the individual Midshipmen, especially the Midshipman Skipper and XO, at the center of all training. It is based on standards and oriented around performance. The offshore program makes the Skipper and XO responsible for training their crew by allowing them to determine the training schedule during the first week of local area sailing. The Skipper then takes the crew and trains them to a proficient level, which includes everything from running the galley to reefing and man-overboard drills. This training schedule helps develop and enhance the technical proficiency of Skippers and XOs. During their first overnight at the end of week 1, the Skipper/ XO team train their crew to adapt to a variety of situations that may arise while at sea. These rehearsals, or sea trials, are the best way for the Skipper/XO team to recognize the individual and collective tasks that still need improvement while identifying the members of the crew to fill the watch captain positions. Finally, the program allows current skippers and XOs to identify and recommend members of their crew to return the following year as XOs themselves. This method helps sustain the training program while fostering an environment of continued proficiency and dedicated leadership.

The final aspect of leader development that the OSTS program offers is reflection. When I returned to West Point in August of 2010, I brought back knowledge and experience to the Army Offshore Sailing Section. I rejoined my coach, Dr. Lee Harrell (a fellow OSTS Skipper and volunteer), and other members of the sailing team to develop a training schedule similar to the OSTS program. Dr. Harrell and I were determined to develop the team into a more competitive sailing program that was on-par with the skill and resolve of its members. This determination emanated from the OSTS program where I not only became a better sailor but developed professionally and gained confidence in my own leadership abilities. Through reflection on my experiences at the Naval Academy and the incredible opportunity I was given, I became better suited for a prominent role on my own sailing team. Although the technical skills I learned through the OSTS program may not be applicable to an Army Officer, the chance I had to make substantial real-time and real-world decisions will remain with me indefinitely.

Mentorship, experience, new knowledge, and the ability to reflect are key elements in professional development. These elements are brought to the forefront through the OSTS program through real-life consequences of decisions made at sea. As Melville surmised, "at sea a fellow comes out". In this way, the OSTS program brings out the leadership potential in every Midshipman. It puts young men and women into challenging situations, forcing them to face whatever fears they have to make quality, educated decisions for their crew. The program inspires its participants to take ownership of their professional development, a notion that will serve a leader well throughout their career. To me, the OSTS program is one of the most defining moments of my development as a junior officer and leader. I am grateful to the United States Naval Academy for providing me with this incredible opportunity and I hope that I may, one day, return to the program.

6.3 STEPPING UP TO LEADERSHIP

Several years ago, at that time in OSTS program history, upper class midshipmen were assigned as Skipper and XO and volunteers as OIC of each boat. FROLIC had two 1/C assigned and serving as Skipper and XO, the balance of the crew were 3/C.

Skipper had VOST experience and knew sail trim extremely well. Nav skills were outstanding. Boat knowledge was very good. Skipper demonstrated competence and confidence. XO had sailed as a 3/C, but not much else. Served as one of the Watch Captains underway. Oversaw the administrative duties of all of the 3/C and tracked training progress, but was very reserved in developing expected skills, such as navigation and boat tactics as Watch Captain. Did not show much self confidence, nor a take-charge attitude. The OIC was matched with the XO's watch section. XO became more of a passenger than a leader and was relatively detached from decision making. This was not consequential in benign offshore conditions, but became apparent when piloting near shore, with the increased risk of grounding or of collision with nav aids or vessels sharing the channel.

FROLIC made a very fast run returning to the Chesapeake Bay from Newport and was south of the Bay Bridge at 0500 on Thursday. Boat was prevented from mooring in Santee Basin until Friday by that year's OPORD, so rather than just knock around the mouth of the Severn, OIC decided to take the boat to St. Michaels for a brief port visit – a tour of the Chesapeake Maritime Museum and soft shell crab sandwiches for the crew.

At that point, OIC conferred with the Skipper and told him to lie back from boat control and to start working on end of cruise admin. OIC then directed the XO to run the entire evolution of planning the excursion and directing the crew for the transit to and from St Michaels. XO was advised that neither the Skipper nor the OIC would intervene unless there was imminent danger. XO was required to step up to the plate. With the gravity of having to make it all happen, XO was forced to plan the track and then integrate all of the inputs of wind conditions, points of sail that didn't line up with the channel, nearby shoals, other contacts sharing the same water, and even put on the binoculars in order to find nav aids, and took fixes with the hockey puck. XO finally had to step outside the comfort zone, use the skills that had been learned during Luce Hall courses and the rest of the cruise, and become the leader
The trip to St. Michaels went well (and only one person didn't care for the crab legs hanging outside of the bun of their soft shell crab sandwich).

Observations.

- The OIC/Coach must create the conditions for personal and professional growth. Sometimes that requires forcing the crew to step up to the gravity of being responsible for planning and safely executing an evolution.

- Be aware of the dynamic where one extremely competent person is relied upon to the extent that the rest of the crew can detach from the details because they are relying upon him/her. Keep them engaged and participating as team member, not a spectator.

Note: The submarine USS GREENEVILLE collided with the research vessel Ehime Maru off Hawaii in 2001. The very charismatic, competent, and confident Skipper lost the forceful support of his watch team because they detached from the tactical picture and placed all their faith in the Skipper. When he missed some key details and indications, the crew wrongly assumed that Skipper knew best. GREENVILLE surfaced beneath the Japanese vessel, sinking it and causing nine fatalities. Several members of the watch team had recognized the indications of a nearby surface contact, but failed to speak up.

- A major challenge is to teach new 3/C to take initiative. During plebe year, they have become used to being told what to do, how to do it and when to do it– often quite forcefully. It is a major change when the paradigm shifts during OSTS and the expectation becomes taking initiative and exercising leadership, both as watchstanders (Watch Captain and Helm) and within the responsibilities of assigned crew billets.

- An additional factor is the challenge of peer leadership. During OSTS, the leader and team are often classmates creating another dynamic. Some handle peer leadership well, more often coaching and reinforcement will be necessary.

6.4 EXPERIENCES AS A TRAINING AID

While teaching Crew Overboard, I've always demonstrated the evolution first myself. If I do it well, the demonstration is, of course, a success. But I've discovered that failure also pays dividends by breaking the nervous tension among the crew. In fact, it works out better, with some crews.

A few years ago, while working up a new crew in Newport, we had ideal training conditions: the smokey sou'wester was blowing a steady 10-15 knots, there was little commercial traffic and the day was warm and sunny. My demonstration went well, and a youngster named Sean enthusiastically volunteered to do the next COB.

He failed on his first attempt. We recovered OSCAR; I did another demo and set up again.

He failed again. Now I had a problem: I could not very well replace him; he was one of my most gung-ho crew, but all his classmates had seen him fail. I could feel his and their nervousness rising.

For lack of any better way to break the tension in the cockpit, I asked Sean about his service selection ambitions.

"Aviation, sir!"

"Really?"

"Oh yes, sir! I've already got my private pilot's ticket and am working on my Instrument rating."

"Sean, let's explain this whole thing another way. We're on which tack?"

"Port tack, sir!"

"Great! When OSCAR goes over the side, I want you to heave to, slow the boat, and then roll downwind into a left-pattern downwind leg, drop the jib, gybe onto a base leg and turn into the wind for a short final. Got that?"

"Got it, Coach!"

And he did. Perfectly. Right on the numbers.

"Sean, had we been on starboard tack, what then?"

"Right hand pattern, Coach?"

Sean became my primary demonstrator / instructor for COB for the rest of the crew.

6.5 EXPERIENTIAL LEARNING

Intent. Learn by doing. This can be very effective and personally rewarding, particularly doing it in a position of responsibility. This may be an opportunity that is unique for midshipmen within OSTS.

Discussion. At the start of the OSTS block, crewmembers of COMMITMENT were encouraged to select a billet that interested them, but was outside their "comfort zone". Prior experience related to the billet was not a requirement, only motivation for the job. Engineer is one billet that many midshipmen avoid because they lack practical mechanical experience

In this case, the Engineer had no prior mechanical experience, did not know how a diesel engine worked and had never worked on an engine. He was, however, motivated and eager to learn. He overcame his apprehension and volunteered for the job. He read the Boat Information Book (BIB), was not afraid to ask questions, studied the various engine and electrical components, and physically traced the coolant, fuel and electrical loops.

The Engineer's challenge occurred when the starter motor for the Yanmar diesel engine failed at sea.

Narrative. OSTS squadron was enroute Annapolis to Freeport, NY. COMMITMENT had sailed very well offshore, and was about 15 miles off the coast, east of Atlantic City. COMMITMENT was about 2 hours ahead of the squadron and hove-to to wait for the nearest boat to catch up. While waiting, the Engineer conducted engine checks. Water was discovered in the fuel. He consulted the BIB and then bled the water out of the Racor filter. After bleeding the water, the engine was tested without apparent difficulty. About 1800, the squadron rendezvoused and proceeded north under sail.

Several hours later, COMMITMENT started the engine. The engine ran for about 30 seconds, then sputtered out. The engine was started three more times with the same results. It was late at night, and the sea state was 3-4 ft, making it a challenge to troubleshoot in the dark.

The Engineer opened the engine compartment to inspect. Air was seen bubbling up through the Racor filter. Air in the fuel lines will prevent an engine from running. Suspecting air in the fuel lines, he ensured the Racor fittings were tight and again attempted to start the engine to bleed the air from the fuel system. He ensured the Racor filter was primed with fuel and that the starter was engaged for no more than 15 seconds in accordance with the BIB. The engine would start, run briefly, then sputter and die. He temporarily closed the engine intake seacock, so as to prevent accumulated water backing up into the muffler and to the engine.

He did this several times, priming the primary fuel filter each time and waiting about one minute between starts so as to not burn out the starter. Each time, the starter was not engaged for more than 15 seconds. The batteries were also paralleled for additional power to start the engine. On the seventh try, the starter emitted a clicking sound and would not turn the engine over. With the sea state and lack of light, further troubleshooting was deferred until daylight.

COMMITMENT minimized all unnecessary electrical equipment (i.e. fans and interior lights) to conserve battery power for radios and navigation equipment and continued to sail. The OTC was notified of the situation. COMMITMENT continued north, intending to resume troubleshooting during daylight and possibly seeking a port to make repairs.

In the morning, COMMITMENT was outside of Ambrose Channel to New York Harbor. Visual inspection of the engine was conducted. No wires on the starter were loose or any other obvious components amiss. We attempted to engage the starter. No joy. An electrical burn smell was detected from the starter. Skipper attempted to call Mike Kearny of the Small Craft Repair Facility for advice. At that point we decided that our best option would be to seek a mooring in New York Harbor to continue troubleshooting.

COMMITMENT called Liberty Landing Marina to see if they could accommodate all four squadron boats. Liberty Landing replied affirmative. In the meantime, Skipper spoke with Mike Kearny and he confirmed

that our primary problem was indeed the starter. The Skipper also suspected additional air in the fuel supply line was preventing the engine from starting. COMMITMENT was advised to loosen the hose clamp on the low pressure side of the secondary fuel filter prior to starting the engine to ensure that the fuel lines (from the fuel tank) were completely purged of air.

The OTC received permission from DNAS for the squadron to dock at Liberty Landing. A van from USNA would bring up a replacement starter and the COMMITMENT crew would make the repair.

Inside New York Harbor and abeam of the Statue of Liberty, COURAGE came alongside COMMITMENT, configured the boats for towing alongside and proceeded into Liberty Landing.

The replacement starter arrived at about 2200 that night. The Engineer was apprehensive about conducting the repairs and stated that he had never worked on an engine before. The Skipper reassured him that he was fully capable to fix the problem.

The Skipper guided the Engineer through the repair, with the Engineer doing the hands-on work. He disconnected the battery and wires from the starter, then removed the faulty starter from the engine block. The replacement starter was installed, wiring and start battery reconnected.

Final step was to ensure that air was completely purged from the fuel lines before engaging the starter. The Engineer loosened the hose clamp on the low pressure side of the secondary fuel filter and covered it with an oil absorbent cloth. The ignition was turned on (energizing the fuel pump) until a smooth stream of fuel flowed from the hose without bubbles. The hose clamp was tightened and the starter engaged.

The engine started successfully and ran normally. Next morning, the squadron departed for Freeport.

Summary. This event was a watershed moment for the Engineer. By doing the hands-on work, he realized that despite his apprehension and lack of mechanical experience, he was able to learn new skills. He became the “MacGyver” of the crew. He subsequently went on to fix other mechanical problems that included a faulty engine blower fan. He was not afraid to read, ask questions and seek knowledge from onboard sources. As a result of his superior performance of duty as Engineer on COMMITMENT, he was recommended for and received the Bing Simpson Maintenance Award.

Lessons Learned.

- Inadvertent introduction of air into the diesel fuel system is not an uncommon problem. While the Boat Information Book (BIB) provides instructions on bleeding air and water from the system, it may be appropriate to require the Engineer to gain the Skipper’s permission before performing this operation. If not an immediate problem, it may be prudent to defer bleeding the system until in port and help may be available, if needed.
- There is no evidence in this case that limitations for cranking an engine (15 sec limit on cranking time and 15 sec between attempts) were violated. However, the clicking sound indicates failure of the solenoid that engages the starter pinion gear. Electrical failure usually occurs from overheating and the “burn smell” supports this. The initial condition of the starter unit may have been marginal. Cranking an engine 7 times without a successful start is “heavy duty.” A sound engine will normally fire / run within 4-5 seconds cranking in 2 or 3 attempts. Be conservative when trouble shooting and attempting to solve problems.
- Modifications have been accomplished in N44’s 26-36 in late 2011 to make the fuel system self bleeding. The problem encountered here should be mitigated. However, ensure you have and use the latest revision of the BIB for troubleshooting and corrective actions.

6.6 PLANNING FOR DEPLOYMENT

Introduction. I would love to tell a sea story - dramatic, fraught with danger and full of excitement - of how a crew of midshipmen cheated death and lived to tell the tale. It is not. Rather, this event illustrates an unglamorous, but tremendously important aspect of OSTS: going to sea is all about planning and preparation. Success will be determined by how well you maximize things you can control (voyage planning, chart preps, crew training, materiel condition, etc.) and your readiness to minimize effects of things you cannot (weather and boat casualties as examples).

Discussion. Time spent preparing and planning IS time well spent. The time spent thinking about "what if" will help keep a crew out of situations that have the potential to go south quickly and result in dramatic sea stories. Such stories often come about because of not planning ahead or failure to anticipate situations.

It is not a question of IF something will not go according to plan, but WHEN. Be prepared to shift from plan A to plan B, plan B to plan C, or even from C to D.

Some key points from this story are provided beforehand. They stem from a first time OSTS port call visit to Westport, CT.

- Planning the details of the deployment is required. Have a (thorough) plan A – with alternatives in your hip pocket.

- Navigation and voyage planning are obvious requirements.

  - What is an acceptable speed of advance (SOA)? 5 knots has been reasonable. Is SOA consistent with intended ETD Annapolis and ETA remote port? Are there windows or limitations at the remote port for ETA / ETD? In Westport, arrival and departure was desired at half of high tide or better to insure adequate depth of water. Additionally, a local sailing regatta would be in progress on the day of arrival and ETA within a one hour window was desired to avoid interfering with racing.

  - What is the plan for early or late arrival? And what is impact ashore of early or late arrival?

  - How will SOA be affected by currents en route? (As will be seen, current in Long Island Sound had a significant effect on the outbound transit to Westport.)

  - Are there logistics considerations? There were no Navy facilities or locations with existing Navy fuel contracts along the track to Westport, so a commercial source was the only option. Factors: Chart, depth of water and navigation to the intended fuel dock, days / hours of operation, communications with fuel facility (VHF and phone), method of payment.

  - Safe havens along the routes? Charts required? There may be an emergency or other set of conditions that warrant entering port or anchoring.

- What resources exist within own squadron to assist in the planning (and later during execution)? Weather knowledge, navigation experience, currents en route, boat mechanical / electrical know-how, local knowledge of area to be visited are examples.

- What resources are available within Navy sailing for planning? OTC's of other squadrons may have already visited your designated port. There are port binders of some ports that have been visited.

- What resources are available at the remote port to assist in planning? In this case, the host organization (Cedar Point Yacht Club in Westport, CT) designated a point of contact (POC) (also an experienced OSTS skipper) that worked closely with the squadron starting 2 months prior to the deployment. He proved to be invaluable in many ways (route determination, arrival time, location to

refuel, local navigation, activities and arrangements ashore (which included berthing for crews) and other details. Then, in real time, he identified a local anchorage and assisted when the squadron anchored overnight (we had arrived well ahead of schedule). And finally, he provided a local craft to guide each STC through the entrance channel to final mooring).

Narrative. This was the first time OSTS ever visited Westport, CT. Westport is midway between the each end of Long Island, Montauk Point to the east and Hell Gate / New York City to the west. Four tracks were possible from Annapolis to Westport.

- South around Cape Charles, northeast to Montauk Pt, through the Race off New London to Westport.

- South around Cape Charles, north to Ambrose Channel, through NYC and Hell Gate to Westport.

- North through the Chesapeake and Delaware Canal, down the Delaware Bay, northeast to Montauk Pt, through the Race to Westport.

- North through the Chesapeake and Delaware Canal, down the Delaware Bay, north to Ambrose Channel, through NYC and Hell Gate to Westport.

A speed of advance (SOA) of 5.0 knots or less was desired. Route 3 (C&D Canal, Delaware Bay, and Montauk Pt) was determined for the outbound track. Route 4 (NYC / Hell Gate, Ambrose Channel, Delaware Bay and C&D Canal) became the homebound track.

The challenge was to meet a very narrow arrival window into the Cedar Point Yacht Club due to a series of scheduled races the day of arrival. The squadron was to arrive no earlier than 1300 and no later than 1400 on Friday. The start and end of the races would impact traffic flow in the narrow channel leading into the yacht basin. The narrow arrival window was necessary to ensure maneuverability in the channel as well as provide slip availability for four Navy 44s inside the yacht basin.

Skippers of the squadron had no prior knowledge / experience with approaches to Westport or prior knowledge regarding refueling marinas or anchorages. Refueling was available at Stratford (east of Westport along the track) or Stamford (west and 7 nm beyond Westport). Stamford was recommended by our POC. Stratford was not desirable as it was located several miles up the Housatonic River with bends and twists and shallow areas. Stamford it was.

An unplanned delay was encountered enroute. An incident on one boat in the Delaware Bay made it necessary for two boats of the squadron divert into CG Station Cape May on Tuesday (2nd day of deployment) while the remainder of the squadron stood by offshore to wait.

Late Wednesday afternoon (3rd day out), the squadron arrived south of Montauk Pt. We received warning of a powerful storm moving east northeast over our area. Decision was stand off south of Montauk so as not to be in Fisher's Island Sound during the storm. The OTC in COMMITMENT initially experienced 42 kts of wind lasting 25-30 minutes, then sustained winds of 28 knots.

Once the storm had passed, winds dropped to 20 knots. The squadron rendezvoused north of Long Island very early the next morning just east of Race Rock and caught a strong following current through the Race. On a beam reach and with a following current, the squadron made 9 knots through eastern Long Island Sound. A very, very exhilarating sleigh ride.

We reevaluated our estimated arrival at Westport. With a 9 knot SOA, the squadron would arrive Thursday afternoon, well ahead of the Friday 1400 desired arrival time. We called and advised our Westport POC.

Radio consultation with the Skippers of the other boats was conducted to weigh options: diverting to the Groton Submarine Base, the Coast Guard Academy at New London, or reversing course and heading back to circle around Block Island.
Circling Block Island was not a good option as current and wind would be against us and storm paths were moving ENE over Block Island. Another option was to refuel and continue west toward New York City, then turn around with sufficient time to make our Friday 1400 arrival time at Westport. However, nighttime traffic would increase as the squadron moved closer toward NYC and currents while returning eastward would not be favorable,

Decision was made to continue westward to fuel in Stamford, 7 nm beyond Westport. Once refueled, the squadron would double back to Cedar Point off Westport and anchor either in Port Jefferson (north shore of Long Island) or off of Cockenoe Island near Cedar Point.

The squadron proceeded to Brewer's Yacht Haven, Stamford. Contact was made with the dockmaster for guidance on how and where to enter. Since this was an unfamiliar channel, the decision was made for the OTC boat to enter the channel first, while the other boats stood off until called in. This was a correct decision as the approach was a bit tricky. The fueling pier could only accommodate two boats at a time and the channel was not wide enough to accommodate waiting boats. After COMMITMENT refueled, one other boat was called in to the fuel pier. Once the first two boats had exited the channel, the other two boats entered the channel and refueled. **NOTE**: Brewer's Yacht Haven in Stamford closed in the fall 2011 and is NOT a fueling option for future OSTS cruises.

After consulting the safe haven charts, another phone conversation with our Westport POC, and reviewing the Coastal Pilot, it was uncertain as to whether Port Jefferson was deep enough to anchor. According to our POC, the Port Jefferson channel had recently been dredged. However, the OTC could find no reference to the depth of the channel or the recent dredging in any of the publications onboard.

The choice to anchor off Cockenoe Island near Cedar Point was the best option, primarily because it would ensure that we would be able to meet our 1400 arrival window. Our Westport POC met the squadron in a small whaleboat off the G1 buoy east of Cockenoe Island and escorted each boat to anchor, ensuring that the anchorage was deep enough and located such that the squadron would be clear of the race courses the following morning. The boats were all at anchor at about 2000, with instructions to set an anchor watch for each boat.

The next morning, crews cleaned their respective boats and had swim call. Anchor was weighed at about 1300 and the squadron was escorted into their berths at Cedar Point Yacht Club.

Lessons Learned.

- There are digital programs available (e.g., Navionics iPad and iPhone apps) that aided in defining each possible track and determining distances. Therefore, required SOAs for given ETD / ETAs on each track could be readily calculated and compared.

- One boat of the squadron had an emergency outbound in the Delaware Bay and diverted to Cape May Coast Guard Station. The original SOA of 5 knots accommodated this delay.

- Our arrival time was planned conservatively. We experienced favorable winds and current in Long Island Sound that combined for a speed of 9 knots. We adjusted en route to improvements in SOA.

- Detailed navigation information, including chartlets, provided by our Westport POC, assisted in evaluating locations for fueling and planning entry to the Cedar Point Yacht Club at Westport. Escort to anchorage and then into Cedar Point Yacht Club was very, very helpful, as the channel into the yacht club arcs around and there are several shoal areas along the channel where a Navy 44 could easily go aground

- Up to date information is essential. If the Coastal Pilot publication is vague with regard to depth in an area, or if you do not have a well detailed safe haven chart, then don't chance anchoring in that

location. Consult the other skippers of the squadron for their ideas. Local information was very useful in making decisions relative to anchoring. Weigh all options, then choose the safest alternative.

- You may not be able to plan for every unplanned challenge enroute; but at least identify safe havens, fueling locations and anchorages along the route.

- Arrival time is important, but navigation and squadron safety trump all.

- Have a plan A, B, C and D in your hip pocket.

- Maximize what you can control. Minimize what you cannot.

6.7 ENGINE FUEL SYSTEM AIR BOUND

Scenario. INTREPID (Navy 44 Mk I) was heading north in the Delaware Bay and was approaching the nuclear power plant located south of Reedy Point. At 0200 just after watch turnover, INTREPID started the engine and was preparing to lower its sails and make preparations to enter the Chesapeake and Delaware (C&D) Canal. One squadron boat had already entered the C&D canal, and ACTIVE was several miles south at Ship John Shoals light.

At 0210, just as INTREPID was approaching Reedy Point, the engine alarm sounded. The engine temperature was noted to be above 210 deg and the engine was immediately shut down. The Engineer went below to open the engine compartment and investigate the cause of the high temperature. Meanwhile, the crew topside raised the main and raised the jib to maintain steerageway. The Skipper ordered a course change to come about and proceed south along the track until the mystery of the engine alarm could be determined.

The Engineer returned above deck to say that he could see nothing wrong with the engine. All hoses looked satisfactory. There was no visible leak from the thermostat and water pump housing. The oil dipstick was checked full and the oil level was normal. There was some fluid in the bilge, and the back part of the engine was slightly wet. The engine cover was left off and the Skipper and the Engineer went below deck to troubleshoot further. The XO was still awake and went topside to assist the helm and crew.

The back of the engine appeared wet with no smell of diesel fuel. The engine alarm was engaged and the skipper directed the XO to start the engine. The engine was started and shortly afterward the engine alarm sounded again and still there was no sign of a leak. The Skipper directed the engine secured. After removing the engine access cover inside of the head (a MK I boat), the source of leak was determined. Corrosion had created a hole the size of a half dollar in the housing of the fresh water heat exchanger and water was spurting out of the hole when the engine was running. The hole was difficult to reach since the space was tight.

The Skipper, XO and the crew discussed their options. Sailboats are required to motor through the C&D canal. They could request a tow from one of the boats in the squadron and be towed back to Annapolis or attempt to plug the hole in the heat exchanger. The repair would have to be strong enough to sustain the heat and pressure of water moving through the heat exchanger. A repair solution was found by using duct tape folded over onto itself several times to form a thick seal, coupled with a vinyl patch from a scrap of sail cloth.

The Engineer then applied the duct tape/vinyl patch and secured it by first adhering the innovative patch with duct tape and then further secured the patch to the fresh water heat exchange by wrapping small stuff around it several times (similar to patching pipes during Plebe Summer damage control training).

After this was completed, the engine alarm was engaged and the engine started. Epic win! The patch held. INTREPID kept the engine running and the Engineer monitored the repair to the heat exchanger as INTREPID transited.

INTREPID contacted ACTIVE and requested that ACTIVE escort them through the C&D canal. INTREPID came about and headed north to the nuclear power plant and waited until they rendezvoused with ACTIVE. As a precaution, INTREPID rigged a towing hawser and ACTIVE rigged a towing bridle for the transit in the C&D canal. INTREPID lowered its sail, entered Reedy Point and transited through the C&D canal under power. INTREPID made it back to Annapolis without any further engine problems. MacGyver would have been proud.

6.8 ENGINE HIGH TEMPERATURE

Scenario. The Engineer of INVINCIBLE took pride in his work. He was always checking the oil level, the bilge condition, belts and had an obsession with keeping the Racor fuel filter bowl clean. Ordinarily, his interest in the engine would be good, however, he often conducted engine maintenance when he was off watch and did so without telling those on watch what he was doing. The Skipper was not concerned with this, as the Engineer was taking the initiative to learn new things.

The Racor filter had not been changed from the previous block. The Skipper had mentioned to the Engineer, that she wanted the Racor filter changed during the boat's duty day in Newport. She and the Engineer would both do this, because the fuel system would need to be bled of air. She wanted him to familiarize himself with the procedure ahead of time and take some time and read the engine manual.

INVINCIBLE was about 2 miles south of Block Island and sailing very well. The winds were from the south, the seas less than 2 ft and the spinnaker was flying. The squadron was heading to Newport and INVINCIBLE was making excellent time; one squadron boat was about 2 miles ahead, INVINCIBLE was the second boat in the squadron. Another boat was five miles behind them and the remainder of the squadron trailing behind.

While the engine was not running, the engineer went below and decided to purge the debris and water from the Racor filter. At 1700, the Nav Watch informed the Helm that they needed to turn on the engine to recharge their batteries. The start battery was not holding a charge well and needed to be recharged frequently throughout the cruise.

The watch was directed to turn on the engine alarm and engage the engine. The engine would not fire. Engine start was attempted again and again. The engine still would not start. The engine start battery, which was very low to begin with, was losing power gradually and cranked the engine a little slower with each attempted engine start. The battery banks were switched to parallel to utilize the ships service batteries to optimize the start. To save battery power, all auxiliary electrical systems (cabin lights, fans, stove etc.) were turned off. The muffler drain plug was opened and the muffler was drained of excess water that had collected there from the previous unsuccessful starts. The engine was engaged and still the engine did not fire. There was a slight odor of diesel fuel and fuel was dripping from the stopcock of the Racor filter. There were no other leaks in the engine compartment.

The Skipper told the Engineer to pull out the engine manual. She then asked the Engineer if he had done any maintenance to the engine recently, because earlier in the day the engine had been running without any problems. He replied that all he had done was drain the Racor filter about an hour ago.

The Skipper was starting to worry. INVINCIBLE needed a working engine to recharge its batteries before nightfall. Sunset was about an hour away, and they would need their battery power to run the navigation equipment, the radios and navigation lights.

The Skipper looked at the Racor and had the engineer tighten the stopcock so the fuel would not be leaking. Then the Skipper, XO and Engineer bounced ideas off of one another and weighed their options. The immediate problem was getting the engine started before sunset. The engine was turning over, so therefore electrical power was going to the starter. Problems with the starter system could be ruled out. With fuel leaking from the Racor, the problem was most likely within the fuel system. The Skipper suspected that, without a good seal at the Racor, air was being introduced into the fuel lines through the Racor each time the engine was cranked.

This was complicated by the fact that each time the engine was cranked, not only was more power from the battery used, additional power was also needed from the battery to push through the cooling water that had been brought into the engine with each starting attempt. When the engine didn't start, the excess water not only collected in the muffler, but inside the engine as well. One fix we didn't initially try, but found in the engine manual, was to close the engine intake seacock temporarily, to push the water

through that collected inside the engine. They drained the muffler again, and closed the engine intake seacock and attempted to start the engine. No joy.

The Skipper and Engineer then decided to go through the procedures to bleed the engine. If this did not work, they would need to contact the nearest boat in the squadron for assistance.

To bleed the engine on a Navy 44 Mk II, the primary and secondary fuel lines must be purged of air. This involves loosening a hex nut at the secondary line and manually pumping the lift pump until the air is purged from that portion of the fuel lines. This procedure requires battery power, so they would have to crank the engine sparingly, so as not to drain the battery. They attempted this procedure five times and still no success. They then added the extra step to pump the rubber bulb on the Racor filter while cranking the engine. They purged air from the Racor bulb, purged air from the primary and secondary fuel bleed points, drained the muffler and closed the seacock. The preheat and starter button were engaged. The engine started. Once the engine was running, the seawater intake seacock was opened.

The troubleshooting procedures took about 45 minutes. The spinnaker was doused and INVINCIBLE continued to Newport under power.

6.9 BRIDGE STRIKE

Summary. While proceeding westbound in the Chesapeake and Delaware Canal (C&D Canal) at night the mast of the INVINCIBLE struck the Chesapeake and Delaware Canal Lift Bridge. The mast broke at the lower spreader and landed on the stern of the vessel. The helmsman suffered a laceration to the head. The root cause of the mishap was a failure in the fundamentals of watchstanding. Contributing factors included fatigue, complacency, inadequate preparation for potential route hazards, and over reliance on visual clues for bridge clearance.

Narrative. INVINCIBLE was on its way back to Annapolis from Newport, RI at the end of a summer OSTS block. Prior to entering the C&D Canal the crew of INVINCIBLE experienced a hot and humid (98ºF / 90% humidity) transit up the Delaware Bay. During this transit the off-duty watch section attempted to rest topside because of the numerous flies and excessive heat inside the cabin. The added disturbance of two sail changes (because of a forecasted thunderstorm that did not materialize) resulted in conditions that were not conducive to rest. The Skipper, concerned about shoal waters and heavy traffic coupled with the difficult conditions for sleeping spent a majority of the day awake (including off duty time) to monitor the transit in the northern portion of the Delaware Bay. The midshipman XO had achieved a limited amount of sleep during his off-duty time. There were no significant material discrepancies prior to entering the C&D Canal.

Shortly after 2100, the two lead STC in the squadron entered the C&D Canal separated by approximately 15 minutes. Shortly thereafter, INVINCIBLE entered the canal as the last of three STCs and was approximately 25 minutes in trail of the 2nd vessel.

The C&D Canal is 14 miles long and has six large bridges with five highway crossings and one railroad crossing. The railroad bridge is the only moveable bridge on the canal (labeled as CONRAIL lift bridge on the chart). Bridge clearances are identified on charts. The railroad lift bridge has a clearance of 138 feet in the high lift position, 130 feet in the low lift position and 45 feet in the down position. The height of the N44 mast for bridge clearance is 65 feet. The railroad bridge is only lowered for the passage of a train. Traffic in the canal is advised of lowering with a sécurité warning on VHF 13 broadcast at 30 minutes prior to lowering, again at 15 minutes prior to lowering, and then immediately prior to lowering.

The bridge here is in the raised position, when lowered it aligns with the railroad tracks on each side (on the bridge abutments).

Conditions for transit of the C&D Canal: Dark with partly to mostly cloudy skies and no moon. Bridges and structures that were lighted were clearly visible. The temperature had dropped into the high 80's. At 2140 the port and starboard watch teams began their turnover. The off-going Skipper turned over the deck to the oncoming midshipman XO. The Skipper remained on deck until 2230 to answer any

questions about the C&D transit and ensure the oncoming crew was comfortable with the transit. During this time the Skipper asked the Nav Watch for the clearance of the first bridge and monitored the transit of the vessel underneath the bridge. During the passage under the bridge both the Skipper and the XO noted how the mast appeared to "just barely clear" the bridge even though it was known that the clearance between the top of the mast and the bridge was 70 feet. This discussion did not lead to any further action.

At 2230 the Skipper went below to sleep. At or around 2315, the Skipper of INVINCIBLE was jolted awake by a collision. The mast of INVINCIBLE struck the lowered span of the railroad lift bridge. The mast buckled at the lower spreader and the upper 2/3's of the rigging and mast above collapsed to the after deck. The XO, on the helm at the time, was struck in the head (9 stitches, no concussion).

The engine was immediately secured to avoid fouling the prop. The Skipper and all hands went topside to assess situation and conduct damage control measures. The water around the boat was swept for rigging and lines prior to restarting the engine to gain steerageway back on the vessel. INVINCIBLE diverted to Chesapeake City Marina where a full assessment of damage and safety stand down were conducted.

S/V INVINCIBLE after returning to Santee Basin

Assessment. The cause of this incident was a failure in the fundamentals of watchstanding. Contributing factors included fatigue, complacency, inadequate preparation for potential route hazards and over reliance on visual clues for bridge clearance.

Failure in the fundamentals of watchstanding. Effective watchstanding includes three fundamental principles: 1) Following the watch standing procedures and requirements for each watch position. 2) Communication and teamwork between watchstanders and between vessels in the squadron. 3) Integration of information, planning and looking ahead. Adherence to these principles leads to situational awareness and foresight.

The Nav Watch did not correctly identify the hazard posed by the railroad bridge. When giving bridge clearance heights the Nav Watch gave the clearance of the lift bridge in the raised position. This was misinterpreted by the cockpit as the clearance of the bridge in the current (down) configuration. The

Skipper, prior to going off watch, did not specifically highlight the hazard posed by the railroad bridge and only gave general instructions to check bridge clearances. Additionally, an assumption was made by the crew that everything would be fine with respect to bridge clearances because two STCs were already transiting ahead and would be circling if they could not proceed further.

The Lookout, sitting in the cockpit, did not correctly ascertain the bridge to be a hazard. In the after action report it was reported that a train was seen going over the lowered bridge prior to reaching the bridge. This did not trigger a reaction by anyone to double check the clearance or verify bridge clearance height provided by the Nav Watch.

The sécurité call by the bridge tender on CH 13 was transmitted at 30 minutes, 15 minutes and just prior to lowering and was heard by other STC's in the squadron. However, it was not heard by the crew of INVINCIBLE. Additionally, the lead STC's did not feel it was necessary to verify that INVINCIBLE had heard the call because it was thought INVINCIBLE was closer in trail and had already passed the railroad bridge. Additionally, the assumption was made that everyone could hear the security' calls.

It was never fully determined why the call was not heard by INVINCIBLE. The following are four possible reasons in order of likelihood:

- Radio set on a fixed channel (such as 82A) instead of set to scan mode. Failure to return the radio to scan had been an omission on previous occasions during the cruise and thus is the most likely possibility in this case.
- Volume turned down too low to hear.
- Radio not channelized properly (CH 13 not in the scan). Some of the crew had been familiarizing themselves with the radio earlier in the trip and could have inadvertently adjusted the scanned frequencies (not likely but possible).
- Radio inoperable or unable to pick up transmission. The latter is least likely because the radio had been working just prior to entering the canal.

Communications is a fundamental duty of all watchstanders. This includes communication between the crew as well as communication with other vessels. Overall, radio and communication problems are not uncommon in the fleet and proper radio usage is a key element of OSTS training.

Misconception on the reliability of visual reference for bridge clearance. The sight angle from the cockpit of a Navy 44 is too shallow to make any determination of bridge clearance by visual reference alone. The only way to ensure proper clearance under a bridge is to check the height of the bridge on a chart and compare it to the known height of the mast. In this incident, the Helmsman and more than one of the topside crew were actually looking up at the mast as they went under the lift bridge. The sight picture looked the same as the previous bridge transit (mast don't appear to have proper clearance until you go under the bridge). The Helmsman was surprised by the collision even though he was looking up at the mast. This difficulty in visually assessing depth was likely exacerbated in this incident due to the dark and moonless night but is still a factor in daylight as is evident in other cases where sailboats have struck a bridge by proceeding underneath based on visual cues alone.

Complacency. The crew had performed well during two severe storms and a period of dense fog off Newport. This success through various challenges left the crew feeling very confident in their abilities. This underlying mood coupled with the relatively tranquil transit of the C&D Canal led to complacency which manifested itself as a lack of attention to detail and a breakdown in the normal communications and routine of the watchstanders. The transit of the canal appeared very benign and relatively unchallenging compared to previous evolutions during the cruise. The members of the watch were not aggressively looking for hazards or any item that may have been overlooked.

The fact that the other two N44 sailboats were transiting ahead also led to a sense of complacency. This, coupled with fatigue, resulted in the crew not making connections between the reported clearance height, the visual clue of the train crossing the bridge and the previously noted site picture that the "mast always looks like it won't clear the bridge."

Adherence to fundamental principles of watch standing (focusing on the responsibilities of your watch position, reporting hazards, communication between crewmembers, looking ahead, etc.) is the tried and tested way to overcome complacency.

The crew of INVINCIBLE was fatigued due to lack of rest on the previous day. Alertness suffered and attention to detail was lacking. This contributed to the sequence of errors that led to the incident. Making an extra effort to follow watchstanding principles can mitigate the effect of fatigue because of the inherent redundancies build into the watch routine to arrest the accumulation of errors that can lead to a mishap.

Prior to the cruise, the only bridge clearances briefed were the Chesapeake Bay Bridge Tunnel (approaching Cape Charles) and the center span of the Chesapeake Bay Bridge. None of the bridge clearances through the East River of New York City or the C&D Canal were briefed because these areas had typically not been a concern. The pre-cruise brief prior to the departure from Annapolis was primarily focused on the trip to Newport. The navigation brief for the return trip was briefed in Newport and concentrated on the rendezvous prior to the transit of New York, the hazards due to shoal waters around Cape May, and the timing of the ebb and flood in Long Island Sound and the Delaware Bay.

A complete pre-cruise brief of the mission including objectives, navigation, communications and potential hazards is standard practice in all naval warfare communities. A solid and thorough brief requires a significant amount of effort to construct and is especially challenging when other requirements such as supply, material readiness, training and navigation prep are competing for limited preparation time. However, the necessity of this brief should not be underestimated. Even though 90% of the items may already be known to the crew the 10% that is unknown is worth the investment. (Especially since no one really knows which pieces compose the missing 10% for each person until you conduct the brief.)

Comments. Proper watchstanding is a systematic way to achieve success during any evolution. Watch standing procedures, born from best practices and lessons learned, provide a means to accomplish the numerous duties and functions in the safe and effective operation of a vessel at sea. Synergy of effort and redundancy are naturally incorporated within the watch routine when duties are fully performed and procedures followed. The fundamentals of watchstanding include communication between crewmembers and integrating all the information while anticipating what is coming up next. The ability of a midshipman to properly stand a watch is one of the most essential underpinnings of the OSTS experience.

There is a tendency to see successful progress by the crew in a relatively short period of time as an invitation to give more responsibility to the midshipmen to further challenge them. During times of lower intensity activity during the cruise, the Skipper and XO of INVINCIBLE would give midshipmen more leadership responsibility by assigning the Watch Captain as the Officer of the Deck (sometimes referred to as Skipper for the Day). Due to the limitations of a four person watch crew the Skipper and the XO rotated themselves into a watch position and quiz the midshipman OOD on what was coming up next and what they were thinking about in order to maintain overall situational awareness. This had worked earlier in the cruise and had provided incentive for the midshipmen crew because they really got to experience a leadership role during these periods.

There are numerous factors that determine the amount of leadership responsibility to give to a particular midshipman in the OSTS training environment. These factors include the competency of the crew, experience and competence of the individual midshipman placed in a leadership role, the environment (weather, sea state, etc.), location of shoal waters, hazards along the track, traffic density, etc. Regardless of the amount of responsibility given to the crew, it is always better for the Skipper and the XO to remove themselves from routine functions such as line handling, sail trimming, helm, etc. in order to maintain a continuous and higher level of situational awareness even during relatively benign conditions.

It has been found during accident investigations in the fleet that several missteps or omissions in combination lead to a mishap. Any single corrective action can break the chain of events leading to an

incident. It is important to become aware of situations where a series of errors is occurring and trigger yourself to step back, assess the situation and find ways to break the link in the chain.

Corrections and program improvements coming from this incident.

- Watchstanders make a report to the Skipper at 5 nm prior to any moveable bridge (draw or lift) along the track.
- Hail all non-fixed bridges on VHF Channel 13 at 3 nm to verify bridge clearance and configuration.
- Require dual concurrence between watchstanders and / or other STC for all “cross under” and “cross over” hazards to navigation.
- Conduct roll call of squadron at the top of odd hours.
- Conduct VHF communications checks between STC of the squadron every six hours.
- Squadrons will rendezvous and transit in company prior to entering restricted waters.

6.10 COLLISION WITH A BUOY

Summary. While proceeding southbound at night in the Delaware Bay, BRAVE collided with lighted buoy G25. There were no personnel injuries, material damage was minimal (bow pulpit railing bent, paint scuff on starboard side). The immediate cause was failure by the watch team to track and avoid G25 after sighting it well ahead. The root cause was failure to establish a satisfactory level of watchstander training and performance prior to deployment.

Narrative. BRAVE conducted three days of boat preparation and training, and a 48 hour shakedown in the Chesapeake Bay. BRAVE then departed USNA Monday noon for a two week deployment to Westport, CT. The track was north in the Chesapeake Bay, through the C&D Canal, down the Delaware Bay, and then offshore to New England. The collision with G25 occurred during the first night of the deployment.

The five STC of the squadron transited the C&D Canal in company starting at sunset and exited the Canal after dark, then continued independently south in the Delaware Bay. Skipper BRAVE **w**as OTC.

Conditions in the Delaware Bay were dark, overcast with good surface visibility, near full moon but no moonlight due to cloud cover. After starting south on the Liston range, BRAVE commenced sailing on a starboard tack with second reef in the mainsail and #4 jib, point of sail close reach to beam reach. Wind 10-15 kts, boat speed 3-4 kts.

After midnight, moderate traffic was encountered on the lower Liston and Cross Ledge ranges, first one merchant southbound /overtaking and then two contacts northbound/meeting (merchant followed closely by a tug pushing ahead). The contact avoidance tactic was to stay outside the channel and establish VHF communications to advise “BRAVE will remain outside the greens” (west of the channel). All contacts passed on BRAVE’s port side as intended.

Meeting/passing of the northbound merchant occurred on the Cross Ledge range. That was followed closely by the tug/barge. BRAVE then turned in the vicinity of G29 to continue south while remaining immediately west of the Miah Maull range.

After passing G27 clear to port, G25 was sighted on the port bow. Sailing on a starboard tack resulted in G25 being behind the jib and not continuously visible to watchstanders.

Shortly before the collision, G25 was sighted immediately on the bow. The helmsman, thinking to stay to the right and outside the channel, put the helm to starboard and toward the wind. The XO / Watch Captain attempted to redirect the helmsman. The only chance to avoid the buoy would have been to put the helm to port and fall off the wind, turning the bow into the channel. At 0210, BRAVE hit G25 head on and the buoy then passed down the starboard side.

Immediate actions: inspect the bilge for evidence of water entry into the hull (none), start the engine to improve steerage way, lower the jib, check steering and propulsion (response normal, no evidence of fouling the prop or rudder), and inspect topside. BRAVE then proceeded to CG Station, Cape May, NJ for further inspections and material assessment.

S/V BRAVE moored at Coast Guard Station, Cape May, NJ

Assessment. The cause of this incident was failures in the fundamentals / "basics" of watchstanding.

- Immediate cause. While G25 was sighted early (estimated range one mile), its relative position on the port bow placed it behind the jib. There should have been a consistent and conscious effort by watchstanders (Lookout, Helm, Watch Captain) to track bearing of G25, bearing change, and range. They did not recognize and mitigate the potential hazard. (Concern: watchstanding)

- Contributing causes.

  - Effective watchstanding has (at least) three components.

    - Satisfactory performance of tasks to be performed by each watchstander (specific examples: Helm maintains intended course, Nav Watch accurately fixes position consistent with fix interval, Lookout identifies and tracks contacts (including navigation aids sighted along the track).

    - Routine communications and teamwork between watchstanders (examples: Helm communicates any change in ability to maintain desired course (contact avoidance, observed depth of water, or changing conditions); Lookout reports and provides routine updates on visual contacts (changes in bearing and range), Nav Watch advises cockpit of navigation aids and hazards expected along the track).
    - Finally, integration of all factors – situational awareness and planning ahead.

  - The Nav Watch focused exclusively on determining and plotting ship's position. He did not identify and report navigation hazards along the track to the cockpit. The relative position of G25

constituted a navigation hazard in addition to being a navigation aid. (Concern: watchstanding, communications)

- Due to current and changing wind direction, the Helmsman had difficulty remaining outside the green navigation aids / west of the designated channel. This was not communicated by the Helmsman nor recognized by the Watch Captain (Skipper at the time). With no traffic ahead, it would have been appropriate to steer in the channel (and commence motor sailing (jib lowered) to insure ability to maneuver effectively). (Concern: communications / situational awareness)

- Passage along the Cross Ledge range required splitting the relatively short distance (400 yards) between the channel and shoal water while managing two meeting situations: the northbound merchant and the tug and barge. This was done satisfactorily. However, a change of thinking was in order when BRAVE continued to the Miah Maull range south of G29. There sea room opens to 800 yards and more. Neither the Nav Watch nor the Watch Captain in the cockpit recognized this opportunity to increase the distance to the buoys marking the west side of the channel. (Concern: situational awareness)

- The collision occurred during turnover of the midshipmen watch section. Turnover, without proper discipline, can be a low point in overall watch performance as off-going individuals focus on their relief rather than remaining alert for changes in the overall picture. At the same time, on-coming personnel are still "coming up to speed." The lookouts acknowledged they spent time discussing the close meeting situations that occurred earlier on the Cross Ledge range. (Concern: watchstanding)

- Finally, and upon review, overall navigation performance since departing Annapolis proved to be unacceptable. Examples: fixes were not consistently determined at intended intervals and DRs were not always plotted, fixes were not always entered in the log, some fixes were incorrectly recorded in the log, the narrative log contained few of the expected entries. (Concern: watchstanding)

- Root cause. The level of watchstander training and performance was inadequate upon completion of local area training and shakedown. Light winds limited meaningful sail training during the three days of Phase I (local operations/crew refresher). Training on sailing skills (ex: gybing, sail trim, and man overboard) and watch section evolutions (ex: reefing, sail changes, man overboard) carried over into Phase II (48 hr shakedown). This significantly limited the time and attention given to watch station responsibilities and watchstanding performance. Failure to achieve proper standards of watchstanding prior to deployment is the root cause of this incident.

Comments.

- Making up during Phase II for training not achieved in Phase I should have been a warning sign. Training in watchstanding responsibilities and performance can only be performed effectively in Phase II.

- There is a tendency to take more credit for training conducted than is appropriate. Teaching the standards and expectations for performance is only a first step; close oversight, coaching, and reinforcement are necessary from the outset. Midshipmen learn quickly and progress appears to be rapid; however, crew members lack experience and initially lack the discipline necessary to stand an effective watch at sea.

- Skipper BRAVE decided to proceed under sail after reaching the upper Liston range. Considering the inexperience of the crew (first night of deployment), continuing under power would have been preferable. The tasks of the watch team would have been reduced and easier (examples: 360 degree visibility from the cockpit without the headsail, enhanced maneuverability should a close contact situation develop, headsail trim not required.

- Training for OSTS deployment is conducted in the Chesapeake Bay where operating conditions are relatively benign. In contrast, operating in the Delaware Bay can be (significantly) more challenging.

Example: Except in the upper Chesapeake, it is relatively easy to avoid close passing situations with merchant traffic by following a track on the side of the Bay away from the buoyed channel. Going south from Annapolis to Cape Charles, the most restricted area occurs at Smith Point, where there is more than a mile from the shipping lane to shoal water on the east. In comparison, on portions of the Liston and Cross Ledge ranges in the Delaware Bay, distances between the channel and shoal water vary between 800 yards and 400 yards. Margin for error is limited.

- Fatigue on the part of the Skipper was a factor in certain actions and decisions within this event. Fatigue is a fact of life at sea, be aware of the hazard and make adjustments so that supervisory watches are rested and on top of their game.

Finally,

- Several factors combined to degrade performance and contributed to hitting the buoy. None were fatal errors in themselves. Certain actions or omissions, if performed consistent with standards, could have broken the chain of events leading to the incident.

- Achieving proper levels of performance, as watchstanders and as a team, leading to safety of operations is a primary responsibility of Skippers and XO's. There are numerous other requirements and expectations in executing an OSTS block but this one must remain primary.

Lessons Learned.

- OSTS blocks extended from three (3) weeks to four (4) weeks to afford greater time for crew training prior to deploying from Annapolis to remote ports.

- Prior to departing Annapolis for deployment or DELMARVA transit, each STC of a squadron will receive a Safe-for-Sea Check ride by a Standardization Officer.

- All Skippers and XO's engaged in training of midshipmen (or under instruction (U/I) instructors) will be D qualified.

- Skippers and XO's will be periodically revalidated for safety and standardization by a Standardization Officer.

- Upper class midshipmen (1/C or 2/C) assigned to crews to serve at Port and Starboard Watch Captains. Previously OSTS crews were composed entirely of 3/C midshipmen.

- Upper class midshipmen (1/C or 2/C) assigned to crews to serve as Port and Starboard Navigator.

6.11 RULES OF THE ROAD AND ETHICS

Scenario. You are the Skipper of a Navy STC on the overnight of a training session for potential Skippers and XOs. A well qualified 2/C is watch captain and at the wheel. You are motor sailing on a starboard tack crossing the Bay but outside the shipping channel. There is a large motor yacht crossing your track from right to left. When you ask the Watch Captain who has the right of way he says in *all seriousness* "We will take right of way because he (the yacht) doesn't know we are motor sailing." What action should or would you take as the Skipper?

Key Points.

- There is a little more to this story. This Midshipman had all of his own sailing gear, the best one could buy. His attitude had been he knew everything. He intended (and did) select aviation training and he felt that he was god's gift to Naval Aviation. He had shown that he knew how to sail, but was he ready to be a leader?

- What I did as the Skipper: I relieved him as Helm and explained the ethics involved. During the rest of the overnight I made sure that I was able to observe his actions closely. During the individual debriefs, I explained that I was not recommending that he serve as a Skipper during summer cruise and that I had decided not to recommend him as XO either. I also voiced my concerns that his attitude might just get him killed flying aircraft and prayed that he would not kill anyone else with reckless actions. It was a shame because he had the knowledge to be an excellent Skipper but not the maturity.

6.12 DODGING A WEATHER BULLET

Scenario. CHALLENGER was exiting the Chesapeake and Delaware Canal (C&D) at the head of the Chesapeake heading toward Annapolis. The day was one of those sticky, oppressively hot, Maryland summer days. The squadron was composed of six boats heading back to USNA from Freeport, NY. The skippers of these boats were all very experienced OSTS skippers; some were senior officers with several years of at-sea experience. This particular cruise block was a compressed two week block of training, three boats originated in Portsmouth, NH, thee boats originated in Annapolis – they met up at Freeport and transited back together as one squadron.

All boats had their main sails up, and three boats were attempting to sail, but the wind was very light from the SW, the rest of the boats were motor sailing. Everyone was in a good mood, since the squadron caught the flood current coming up Delaware Bay and through the C&D Canal and was making excellent time. It looked as if the squadron would arrive back to Annapolis, well ahead of schedule.

CHALLENGER was assigned as the weather boat for the squadron. The skipper of CHALLENGER was off watch, but had difficulty sleeping because of the heat and humidity. She asked to be awakened prior to exiting the C&D Canal, because the navigation at the head of the Chesapeake is tricky and the navigable channel not only winds and bends, but also narrows significantly.

Her XO woke her up and she looked at the chart and saw that they were out of the C&D Canal and entering the channel at the head of the Chesapeake. When she went up on deck, she noticed that the sky had a copper green-gray cast to it. It was impossible to distinguish cloud type – because the entire sky was overcast. She then looked at the hourly log, where she had the midshipmen log the hourly barometer trends. The barometer was dropping and had dropped 6 mbs in 3 hours. She then dialed in the NOAA Wx broadcast. The recorded forecast was for 35 knots of wind for Baltimore. The weather map from the weather fax was garbled and unreadable. The radar was turned on to locate the line of thunderstorms. Radar did not show any individual cells, but rather one big radar return, south of their position. The skipper then used a cell phone to call the forecaster at the Naval Air Station Patuxent River and asked for a more detailed forecast.

The Naval Air Station Patuxent River forecaster told her that their doppler radar showed cloud tops to 38,000 ft and that he thought the NOAA forecast of 35 knots was conservative --- to expect at least 50 knots of wind in our location.

The skipper of CHALLENGER immediately called the Squadron OTC to report the situation and recommended that the squadron pull into the Sassafras River to wait out the coming storm. The OTC responded, “Let’s put it to a vote”.

The overall response back from the squadron boats was to deny the report. – “Well, I’m already past the Sassafras and sailing” or “I’d like to keep going, if the winds pick up, I can reef quickly”, or “NOAA tends to over forecast the winds ”. This response was incredible, the other Skippers were senior officers with several years of at-sea experience and almost all of the skippers of the squadron had been involved with OSTS for several years.

Despite being outvoted, the Skipper of CHALLENGER kept pressing her point, reiterating that she spoke with the Patuxent River aviation forecaster directly, who expected 50 knots and pointed out that we were in a narrowest part of the Bay and that a green sky was a sure sign of hail. She then added, “Look , we are way ahead of schedule, and since we hit the rough weather off of the coast, I have a lot of food that I need to use up. Let’s just anchor, it will give the Mids a break and if it doesn’t pan out, you can blame me for not getting back to Annapolis ahead of schedule”. The squadron navigator finally added, “I’m with CHALLENGER, if she thinks we should anchor, we should anchor.”

The boats then proceeded into the mouth of the Sassafras River, which is a very shallow body of water. Because of the shallow depth of the river, the squadron didn’t go too far upriver and anchored about ½

mile inside the mouth. CHALLENGER set the 35 lbs anchor. As the squadron anchored, a civilian boat was moving farther upriver with its storm sails rigged.

About 10 minutes after the anchor was set, the midshipmen proceeded below to prepare lunch. About 20 minutes after setting the anchor, thunder could be heard in the distance. Cloud to cloud lightning etched across the sky and the thunder was noticeably closer. Then, BOOM, the wind hit! It was as if the boat was hit with a jet blast. Under bare poles, in the protected cove, the boat violently heeled to one side and hail the size of nickels rained down. Lightning lit up the entire sky and the immediate thunderclap that followed was deafening. Wind went from light to 54 knots sustained in less than a minute. Visibility in the Sassafras decreased to almost nothing. The back of the boat's transom was barely visible in the hail storm. Even though we were anchored in 20 ft of water, the waves in the Sassafras were a maelstrom and were higher than the back of the boat.

The Skipper was on deck when the wind and the hail hit, and called down to the midshipmen, "turn off the stove, engage the engine alarm and hang on". She then started the engine to take the strain off of the anchor. While on deck the Skipper glanced at the wind gauge that was holding steady at 54 knots and gusting to 62 knots.

The storm lasted about 20 minutes and as suddenly as it had started, it stopped. Everything became very quiet and still and the sky cleared. The immediate silence was broken by the OTC's transmission on 82A, "Is everyone alright?"

After the storm, the midshipmen came up excitedly on deck to recount their new sea story. Meanwhile, the skipper of CHALLENGER went below, so the Mids would not see how badly she was shaking. Once below deck, she uttered a grateful prayer of thanks for dodging a huge weather bullet.

She reflected upon the mishap the squadron just avoided -- the sudden and violent onset of the storm, the winds increasing from light to 54 knots sustained in less than a minute, the squadron in a narrow channel, visibility reduced to zero, boats with full mains and jibs up and with relatively inexperienced midshipmen crews not strapped in - there surely would have been sails ripped, boats aground, crews overboard and without a doubt, people hurt or worse. The skipper of CHALLENGER determined that what they had experienced was a microburst (the collapse of a towering cumulonimbus cloud).

She had been through heavy seas and storm conditions offshore before, but in the case of storms offshore, she had time to prepare well in advance. There was time to rig the storm sails, tie things down, don tech vests, strap in and prepare; without the hazard of running aground. In the case of the microburst, the winds had come on so suddenly and so violently, there would have been no time to react, even with a seasoned crew. Even under power, the boat would not have been able to counter the power of the 54 knots sustained winds and gusts of 62 knots.

The next day, the squadron arrived back at USNA. The Capital Newspaper that evening reported Ellicott City, north of Baltimore, was cleaning up from a tornado that had touched down, generated by the storm that blew through the day before.

Key Points.

- Everyone in the squadron was excited about getting back earlier than planned.
- When the Skipper of CHALLENGER voiced a legitimate and valid concern for the safety of the squadron, the OTC should never have said, "Let's put it to a vote."
- Navy 44 radar is NOT a doppler radar. Navy 44 radar is good for picking out the location of individual thunder cells. A doppler radar can distinguish the height of the clouds.
- The green sky along with the rapid drop in barometer pressure, plus the height of the cloud tops, the NOAA weather broadcast were a key factors that indicated that this was not going to be the average Maryland thunderstorm.

6.13 RUDDER CASUALTY

Scenario. Normal rudder control failed during an uncontrolled gybe. Control of the STC was lost until the emergency tiller was rigged and the engine placed in operation to regain steerage way. Potential for personnel injury and further damage was mitigated by excellent situational awareness and the immediate actions of the Midshipman Skipper.

The boat was off-shore en route to Newport. The OSTS crew had minimum experience, having departed Annapolis just three days before. Increasing winds during the night had been predicted. This casualty occurred during full darkness (about 0300) in difficult conditions (wind 15 knots, gusting to 20+ / seas 5-6 ft). The Skipper was initially below and the XO on deck.

The boat tacked from close-hauled starboard to close-hauled port, but poor crew coordination led to backing the jib. The bow was turned back through the wind to re-establish a starboard tack; but in doing so, steerage way was significantly reduced. Because of the gusts and varying direction of the wind (estimated 30-40 degrees), the jib then backed a second time and the bow fell off to leeward (starboard). Helm did not recognize that steerage way had been lost and continued to hold the rudder to port, attempting to bring the bow again through the wind to correct the backed jib.

The bow continued to turn to starboard leading to an uncontrolled gybe. As the stern came through the wind, the seas took control of the rudder, wrested the wheel from the hands of the helmsman and shifted the rudder rapidly from full port to hard over starboard. As the rudder shifted, the steering cable jammed in one of the turning blocks and parted, rendering the helm inoperative.

The Skipper, awakened by the noise on deck and boat movement, came on deck, assessed the situation and immediately directed corrective actions. The emergency tiller was rigged and control of the rudder regained. The engine was started and engaged to gain headway and steerage way. The bow was brought into the wind and the jib doused and secured on the forward deck. A reef was taken in the mainsail.

With the situation stabilized, the Skipper ordered the boat to come off the wind on starboard tack. The mainsail boom suddenly streamed full out to port. The mainsheet was free of the port winch self tailer and the boom therefore uncontrolled. The Skipper ordered the starboard preventer led to the starboard toe rail and tensioned to bring the boom amidships. The port preventer was secured to the port toe rail and tensioned to gain control of the boom in both directions.

The port side of the mainsheet was secured on its winch, returning the mainsheet to the normal configuration. However, the stopper knot normally tied at the end of the mainsheet was missing and the end of the sheet was frayed over several inches from the bitter end.

The boat diverted to Freeport (Long Island), NY for repairs to the steering system.

Key Points.

- The Midshipman Skipper demonstrated superior situational awareness and took excellent immediate actions in directing his crew, regaining control of the boat, stabilizing all aspects of the casualty and preventing personnel injury (the uncontrolled boom). Notably, he also promptly reviewed the incident with his crew (thereby maintaining confidence in themselves and in their boat).

- However, personnel error was the immediate cause of the aborted tack and this led to a cascading series of mishaps making this a significant, potentially serious, event.

- Helmsman gave the correct preparatory order for tacking; “Ready about.” But he failed to get the required acknowledgement from his crew, i.e. “Ready starboard” and “Ready port.” Neither the XO nor any crew member intervened to correct this error. Standard commands and responses were not enforced. Helmsman immediately put the rudder over, bringing the bow through the wind. The active sheet was not cast off and the jib backed. This set the stage for everything that followed.

- Helmsman then corrected the backed jib by turning the boat back through the wind to regain operation on starboard tack. While not wrong, an alternative would have been to cast off the active sheet, take on the prior lazy sheet and trim the jib for port tack. However, turning back through the wind compounded the initial error by causing loss of steerage way.

- The gusting wind caused the jib to back a second time and, with no steerage way, the bow fell off to leeward leading to an uncontrolled gybe.

- Helmsman kept the rudder hard to port, attempting to correct the bow's movement to starboard. When the stern came through the wind, the sea action on the rudder shifted it hard to starboard, and the steering cable parted. Simply put, when Mother Nature takes control it is advisable to adjust to the existing forces. If the rudder had been moved to starboard as the bow moved to starboard, the rudder casualty may have been prevented.

- It could not be determined just when (or why) the port side mainsheet was not properly secured in the self tailer (causing the boom to run free). The full situation became clear after return to Annapolis (10 days later) when the engine stopped while moving the boat under power from the Cutter Shed to its normal Santee Basin slip. The bitter end of the main sheet was found wrapped around the prop / propeller shaft.

- Not understood in the near term, the end of the main sheet had been overboard and become fouled in the prop. Control of the main sheet had been restored, but the abnormal symptoms observed (frayed bitter end) had not been pursued to an accurate resolution. Engine power could have been lost at any point following the initial casualty (including the transit from Freeport to Annapolis).

- Final thought: Before starting the engine, insure lines / sheets are clear of the water.

6.14 FOULED PROPELLER

Summary. The tail of the mainsail halyard fouled the STC propeller during a violent thunderstorm when STC broached, causing the tail of the halyard to wash overboard. Mechanical propulsion and the ability to fully lower the mainsail were lost. The potential for personnel injury and further damage was mitigated by excellent situational awareness and immediate actions of the Skipper and crew.

Narrative. During the mid afternoon after a southbound transit of the Chesapeake Bay, WARRIOR exited the Bay via the Chesapeake Channel of the bridge tunnel about 1500. After clearing shoal water, WARRIOR set a northeasterly course for Newport, RI. Winds were 8-10 knots, skies clear, excellent visibility (7-10 Nm), seas <1 ft.

WARRIOR had just set the #1 headsail, (#3 secured on starboard side toe rail with sail ties) and was sailing with a full main on port tack, broad reach. Within 5 min. of setting the #1 jib, the Skipper noticed dark gray / black skies approaching rapidly from the SSW. Skipper ordered the #1 lowered and secured on deck, (hanked on, sheeted and tied to port toe rail), and a double reef was taken on the mainsail. All lines (halyards, sheets) secured on respective winches.

Taking the helm, the Skipper minimized the crew topside (3 personnel total: helm, mainsheet, boom vang), ordered life vests / foul weather gear donned, radar energized, navigation lights energized, engine started for contact avoidance (commercial fishing boat within ½ mile) and maneuvered to evade storm cell. Skipper additionally ordered XO to verify crew count and manage electronic navigation, radar/contact avoidance.

As storm approached, WARRIOR came into the wind to minimize potential of accidental jibing and used mechanical propulsion to maintain headway. WARRIOR broached to starboard; and Skipper ordered boomvang dumped and mainsheet eased to recover. After recovery, boom vang and mainsheet were trimmed. WARRIOR experienced four series of knocked downs to port and starboard sides, all recovered by using main, vang and mechanical propulsion maintain headway; heading into the wind and keeping WARRIOR standing upright.

During the final knock down WARRIOR's shaft / prop caught the main halyard tail that was dragging in the water from the previous knock down. The engine shut down due to the fouled prop. The storm subsided / passed as quickly as it had approached and was followed by clear skies, winds <5 knots. Winds noted during incident 45-50 knots steady; peak 60-65 knots.

Immediate Actions. Immediately following the passage of the storm cell, the following actions were taken:

- Crew status / safety assessed (no issues).
- Checked for additional weather / storms approaching (none via radar and VHF).
- Assessed material condition / damage: engine / shafting inoperable; leech tape on mainsail and #1 jib torn, sail ties securing #1 and #3 jibs parted.
- Inspected bilges and conducted detailed material inspection conducted.
- Notified OTC.
- Set #3 jib to regain speed / control (#3 and doubled reefed mainsail).

Additionally, since the main halyard was inoperable, a crew member was sent aloft to swap the jammed main halyard with a spinnaker halyard to allow the main to be lowered when required. WARRIOR rendezvoused with other boats of the squadron and awaited OTC arrival for assistance / tow. OTC in turn contacted Navy Sailing Duty Officer (NSDO) via satellite phone and NSDO arranged for Coast Guard rendezvous for tow to Cape Charles Coast Guard station.

Preparations for Towing. Towing is not a common evolution. In most cases, this evolution is conducted due to necessity. Thinking through and briefing the evolution from both towing vessel and towed vessel

and the specific steps in conducting this event are important to minimize confusion while safely executing the evolution.

Preparation for towing is an all hands event. For the vessel being towed, clear as much gear as practical prior to rendezvous. Lower, fold and strike below headsails, clear lines (jib sheets, spinnaker sheets and guys, reaching strut, and preventers, as not required), lower and furl mainsail and secure boom. Communicate between towing and towed vessel, type of tow (alongside or astern), who will provide tow line, method of make-up (bow cleat, mast), approach and required actions for each vessel.

WARRIOR's initial tow make-up was alongside with fenders provided by WARRIOR and the OTC and standard alongside make-up with bow, stern, forward spring and a double aft spring. Lines were secured to WARRIOR and tended by tow vessel (OTC). (NOTE: Ensure sufficient forward / aft separation to prevent spreaders and shrouds from colliding). This method was initially chosen to make headway, start closing land and to provide additional time to make ready for astern towing. Although not the optimal method of towing, the sea state was minimal to prevent hull damage.

With both vessels alongside, the OTC and WARRIOR's Skipper were able to clearly communicate and discuss the anticipated weather advisories for the upcoming second storm around 2300 that evening and the method of transitioning from towing alongside to towing astern. Astern towing preparations were made with the fixed end of the towing hawser attached to a breakaway fixture on the towing vessel. The towing hawser tail was led outboard of WARRIOR's shrouds / lifelines, forward to WARRIOR's bow, through the pulpit, aft to WARRIOR's mast (two round turns around the mast with the tail led and secured to the port aft deck winch). This rigging method addressed three important concerns:

- Allowed for dynamic loading of towed vessel when hawser strain increased as towed vessel increased speed. Towing hawser could be surged to ease load strain.
- Allowed for length of tow scope adjustment such that the towed vessel is in the second wave behind the towing vessel and both are riding in the same relative location on their respective waves (face, back or trough) so that the tow line has a steady strain and not subjected to recurring cycles of heavy stress / slack (Annapolis Book of Seamanship).
- Allowed for quick and easy breakaway when required.

These preparations were well served in the transition from towing alongside to towing astern and casting off when required. This transition was seamless and allowed both vessels to proceed as the weather worsened. After shifting to towing astern, max winds experienced were 20-25 knots, thunderstorms and lightning with 3-5 ft. seas.

Upon rendezvousing with the Coast Guard, information (size of vessel, size of bow cleats, etc.) was exchanged; WARRIOR cast off the OTC and received a towing bridle (via messenger line) from the Coast Guard. The towing bridle was passed through the center of each bow cleat then around the aft horn with the eye passed over the cleats forward horn. The CG controlled the scope and was conscientious with regard to WARRIOR's ride and sea keeping.

Key Points.

- Reefing drills a must. Significant focus of Phase I (Crew Refresher Training / daily ops) and Phase II (Crew and Vessel Cert / 48 hr shakedown) included a significant amount of reefing, sail changes, emergency procedures evolutions. These evolutions become an all hands event. EVERYONE needs to understand and be able to operate at ALL these locations PRIOR to Phase III (Classroom Afloat / transit to remote port) training.

- Storm cells are violent with severe oscillation of weather direction. You need to be prepared for the unknown on how your vessel will react. Know what your sea room is and gut it out.

- Eternal vigilance a must. Cells are quick moving and violent. Although there can only be one Skipper, EVERYONE aboard is a Lookout when on deck, regardless of watch section.

- Continually review alternatives and contingencies. With the main halyard unable to be lowered/raised, WARRIOR had to send a man aloft to swap the main halyard with a spinnaker halyard. Note: WARRIOR had a messenger on board of sufficient length to support replacing halyards. Messenger was attached to main halyard and secured during halyard swap. Recommend all boats have a designated messenger aboard.

- Think ahead from a maintenance perspective. Even though you may need pier side support, you can assist by running messengers and securing lines to ease repair time. Salvage and reclaim material where practical. Repair time was minimized since a messenger was rigged, and the halyard was salvaged.

- Unless you are in a controlled environment, NEVER, NEVER, NEVER send a crewman over the side to try to attempt to free the situation. It is NOT worth the risk.

- Make use of the handheld VHF. In adverse conditions, the relative noise level increases significantly. Use the handheld as an additional sound speaker (only) for situational awareness. However have only one radio communicator from the navigation table. Speaking over a topside handset in high winds and storm conditions prove unclear and useless.

Leadership and Command. There is no substitution and reward for Command. However, with Command comes Responsibility. Part of Command is pushing to think several steps / possibilities ahead. Although every evolution can be used as a training evolution, there are times when the Skipper and XO must step in and intervene (by taking the helm, etc). The Skipper and XO's command presence, confidence and leadership become a model and gauge in the ability for the crew to confidently perform in adverse conditions. When in Command, take Command.

Footnote. When WARRIOR finally tied up at Coast Guard Station Cape Charles (at 0500, almost 12 hours later), the common thread of discussion among the crew was their personal feeling of HOW scared they were (not IF they were scared). During the storm, the experience, presence and confidence of the Skipper's actions and direction were important for the crew to maintain confidence in their ability to perform and prevail. The XO (a fleet LCDR) was asked several times if "we" were going to make it? His calm and confident response "Look at the Skipper…we'll be OK" was sufficient to re-focus the crew.

6.15 LIGHTNING STRIKE

Summary. During the first night of the 48-hour shakedown, the N44 was struck by lightning during an intense thunderstorm. No one was injured, but navigation systems, radios and other instruments were disabled. The boat anchored in the Severn River until daylight and then returned to Santee Basin for repairs.

Narrative. GALLANT was executing Phase II (48-hour shakedown) by sailing down the Bay in company with DARING – the only two boats in the block. The Skipper of DARING was a very experienced Bay and OSTS sailor. GALLANT's Skipper was an active duty CDR (aviator) with significant sailing experience and on his second cruise as a Skipper. Weather was briefed to be scattered afternoon thunderstorms as is typical in June. The plan was to sail south all evening and turn around in the vicinity of Smith Island (Maryland) in order to be in the Miles River / Saint Michaels by Friday afternoon.

Both boats fueled and departed Annapolis at 1500 Thursday and remained in sight of one another until sunset. Winds were 5-10 knots from the west that made for easy, quick sailing south. By 2000, however, it was apparent our head was not working so efforts to fix it were undertaken. After communication with DARING, GALLANT elected to start sailing back north toward USNA in case we could not get the head to function. It was also decided to increase our separation for the evening to avoid any close quarter traffic issues.

Thunderstorms were seen off to the north at 2200 around what appeared to be Greenbury Point. so we started heading back south using a bucket as the head. This first round of storms passed behind us (we were still south of Thomas Pt.) and once they appeared to settle down, we turned back north. The plan was to make Santee Basin as early as possible to fix the head and go back out.

Another round of thunderstorms appeared on the horizon around 0100. Radar showed this to be a much larger, organized clutch of cells than seen earlier at 2200 and they were moving toward the Bay at about 20 knots. We turned back south again in an effort to miss them as done before. We even started the engine and set 2200 rpm in an attempt to miss the storms but it became obvious after about a half hour we would be unsuccessful. DARING had been north of us since sunset and was actually close to Greenbury Point. when this second round came through. We both communicated that it was apparent we would each have to just hang on and take it this time.

We put a second reef in the main (the #3 jib was already up for the evening) and prepared to bear off before the storm. I had been taught as an OSTS XO that keeping the wind on or slightly aft of the beam was a good strategy and had safely navigated cells before with this tactic. I briefed the watch section this would be the plan. We were west of the channel, just south of Thomas Point Shoal Lighthouse, so we didn't have much room to maneuver back to the west (shortening the engagement time). We took an easterly heading with wind just aft of the beam. The breeze started to freshen from the northwest and was easily 10-15^{o} cooler than the evening air at approximately 0130. I briefed the XO below to let the off section know it was going to get rough. I elected to man the main sheet, standing in front of the binnacle, and each sheet trimmer was secured in the cockpit.

Over the first half hour, winds steadily rose from 10 to 45 knots from the NNW and I eased the mainsheet a little at a time to depower. I would occasionally give helm orders to ensure the wind on the beam as the gusts were causing shifts of 30 degrees or so. I also had the sheet trimmer easing the jib sheet, but once the wind exceeded 40 knots, the jib failed at the clew and began to flog severely. This certainly made the helm difficult to manage while the boat was making over 10 knots in a building sea state and communication was possible only by shouting and hand signals. All this was on just the second day of sail training as we had lost Monday due to a safety stand-down.

While the jib was a mess, the boat actually sailed quite well. The highest boat speed I saw was 10.4 knots, but she was riding fairly upright and the seas were still confused. Once the wind was steady at 45 knots, however, the hail began. I turned to see the helmsman guarding his face from the marbles with one arm, and his hand firmly on the helm with the other. He yelled over the maelstrom, asking what he

should do and I urged to just keep sailing and that is exactly what he did. The wind continued to increase; first to 50 knots and I eased what main sheet I had left. The main was almost on the spreaders when the wind gusted to 65 and the boat heeled over far enough to dip the boom in the water according to the sheet trimmers. Simultaneously, a quick series of 4 or 5 lightning/thunder sequences occurred. I knew it was all close because there was no time delay between flash and boom. During the flashes, I tried to inspect the rig, fearing failure at this point. It held up well, despite the fact I failed to increase backstay tension before storm hit.

It was one of these flashes that struck us, though I could not tell which one. My first inkling was the strong ozone smell and I recall thinking, "Wow – the smell lingers even in 60 knots of wind!" Then I realized all the wind instruments were dark. I stuck my head in the hatch and could smell the ozone very strongly below so I told the crew to begin inspecting for an electrical fire and flooding (thru-hull valve failure). The navigator announced all the radios and navigation had gone dark as well. The crew reported back they could see no signs of fire, smoke, or flooding. All good considering we had been struck by lightning.

Fortunately, the wind was beginning to ease back to what I would estimate as 40 knots and I could start to see the lights of the ships at anchor off Annapolis. The sea state had built to about 4-5 feet at this point and it was uncomfortable being beam-to so I told the starboard sheet trimmer to start the engine. I told the helmsman to use it to help get the boat into the waves (and wind). However, it was only seconds later I got reports of smoke from below. I asked the sheet trimmer to check the engine temp and she said, "Sir, it's pegged to the right." We immediately secured the engine. By this time, the wind had subsided to about 15 knots so we tacked the boat back to the NW and headed to the anchor lights.

I have to admit, my brain was fairly rattled and it was the XO who thought to call somebody. He used his cell phone to call DARING. They had seen similar weather, but had fared much better. Their skipper secured all sails and sent everyone below but himself at the helm. The XO advised them of our status and they suggested calling the Coast Guard. We did, but they were busy with other issues and could not get to us for over an hour. We told them we would continue to sail towards Annapolis.

I also forgot we had a hand held GPS so I directed the crew to get to work fixing us using Thomas Pt., the bridge, and Greenbury Point. I directed five minute fixes and they tackled the evolution with great enthusiasm having now realized this was the only way we could stay off the bottom on the way in. Fortunately, all the DC lights below worked throughout the entire situation. The off duty section got to work troubleshooting the engine and found the top had popped off the overflow coolant tank and dumped a significant amount of coolant into the engine bilge. I then began making plans for how we would dead stick the boat into Santee Basin.

My solution was to just anchor across the river from Robert Crown as we could see a third round of storms on the way. It took us about an hour to get back to Triton Light. We dropped the big anchor off the bow making about 2 knots straight up the Severn. We cheated to the northern side to stay out of the channel since it was still dark and I didn't know if the anchor light would work (it didn't). Once the hook was set, we switched sections, plotted our swing circle, and continued to take fixes for a half hour to make sure we weren't dragging anchor. At this point, we had to time check the weather with our smart phones and could see the third group of storms was going to be significant. I elected to drop the second anchor off the stern that turned out to be a good decision given the strength of the last round of storms. While riding out the last group of cells, we topped off the coolant, op checked for leaks and decided to run it long enough to raise the anchors and motor into Santee Basin.

Post mortem the next day showed a lightning strike directly atop the mast, melting the various radio antennas and frying all the electronic equipment. However, the boat's grounding straps all did their job, no catastrophic damage to the boat, and no one was hurt.

Lessons Learned.

- Don't ever quit sailing the boat. That is, don't ever give up. As soon as we seemed to tackle and subdue one emergency, there was still more to do to ensure the boat and crew were safely secured. We could not afford to quit thinking and evaluating even at anchor.

- Piloting by a paper chart really matters! There really CAN be a time you don't have the GPS.

- Drill early and often. You don't know when you will be faced with an extremis situation – maybe even the second day out.

- As a Skipper, plan for every contingency you can think of. The idea of anchoring came from my training with more experienced Skippers who have seen what some may think as ridiculous scenarios.

- This boat is tough with the right sail configuration.

- The discretion of DARING was clearly the better part of valor. However, I stand by my strategy to sail the boat. Had I dumped the jib, we could have certainly saved its demise, but we may still have been struck by lightning given the heart of the strongest cell passed directly over us. The midshipmen had their first taste of the forces of the sea and learned that good strategies and procedures will see them through safely.

6.16 CATCHING A CRAB POT

Scenario. You are the skipper of a Jeanneau 43DS (43-foot) chartered sailing vessel on the Eastern Bay with a crew of 6. You are 2 nautical miles (nm) south of Bloody Point Light exiting Eastern Bay into the Chesapeake Bay. It is 0330 and you are sailing on SE course at 5 knots. You have a full main and the 120% jib is unfurled. Night is clear and moonless. Suddenly the boat shudders and is pulled immediately to the left. What action should or would you take as the instructor?

Key Points.

- Helmsman attempted to correct the turn but the helm was unresponsive.

- There were no other contacts visible so no immediate threat of collision. The boat also did not feel to be aground.

- All hands were called “on deck” and the auxiliary engine was started but left in neutral.

- A look around the boat with a spotlight at the waterline showed no lines in the water or abnormal conditions.

- The position of the boat was taken using the installed GPS / chart plotter. The boat was in the channel in a water depth of 25 feet. The boat had a draft of 5.2 feet.

- After about 2 minutes, the boat rolled up into the wind. The mainsail and the jib sheets were released. The engine transmission was engaged, and the boat shook excessively. The engine was immediately put back in neutral. Again, another look around the boat showed no lines in the water.

- At this point we suspected we had snagged a crab pot line that caused the boat to veer left until the line broke from the pot.

- The emergency tiller was installed and helm control shifted. The helm appeared to be responsive.

- We still had good winds and maneuvered the boat under sail until we were heading W-NW back into the Chesapeake Bay. Our destination was Annapolis.

- After about a half-hour using the emergency tiller, we tested helm control at the wheel and all seemed normal. Decision was made to return helm control to the wheel.

- Since we suspected we had snagged a crab point, decision was made to not engage the engine to prevent further damage to the propeller and rudder. At this point the boat was sailing normally.

- At dawn, the winds were still blowing about 7 knots out of the south. After sunrise, we also were able to see we were trailing a couple of lines from the stern of the boat. This confirmed our suspicion we had snagged a crab pot overnight.

- By noon, we were in the vicinity of Thomas Point Shoal Light and the winds went dead calm. At this point the boat was adrift in the main channel of the Chesapeake Bay with water depth at 65 feet. Although we were in no immediate danger, we were drifting at the mercy of the current, which was ebbing. We also did not carry the day shape (2 vertical black balls) for a vessel “not under command and not making way”, so we kept a vigilant watch on VHF Channel 16 to alert any passing traffic of our casualty.

- At this point, we called “TowBoatUS” to tow us back to Annapolis. The skipper had BoatUS towing insurance so the there was no cost for the tow. Once the tow boat was called, the sails were taken down/furled, and the anchor was readied in case we needed it to prevent grounding.

- Once back in Annapolis (Back Creek), a diver found that the boat had snagged two crab pot lines that were wrapped around the propeller and rudder stock. The decision not to re-engage the engine transmission was the right decision. We were also fortunate that we maintained helm control given the fouling around the rudder stock.

- No damage to the boat was sustained as a result of this incident and we were back out sailing the following day.

- Although crab fishermen are not supposed to place their crab pots in the main channels, they did and the markers are very had to see on a dark, moonless night.

6.17 HEAD AND HOLDING TANK BLOCKAGE

Scenario. The head and holding tank system in INVINCIBLE became blocked and inoperable while off-shore. Trouble shooting and repairs were completed by the crew using on board tools and materials and the system returned to full service. No further assistance was required upon return to Santee Basin. The crew tackled the problem and made a complete fix. It is an excellent example of resourcefulness and perseverance, systematic trouble shooting and the crew making do with what they had.

During the first week of training in local waters, discussion on the waterfront indicted the holding tank system of the MK II N44's could be prone to blockage. The MK IIs were new and just coming into service. There were reports of difficulty in flushing the system.

The passage for this particular block was a circumnavigation of the Delmarva Peninsula (down the Bay, around Cape Charles, north along the VA / DE coast and Delaware Bay, through C&D Canal, and return to Annapolis).

During the second day while sailing northbound off the coast, the system became blocked. The head was very hard to pump with significant resistance to moving the pump handle back and forth. Use of the head was suspended and alternate steps were determined and agreed by all hands for handling head requirements (i.e., "the old oaken bucket").

Plans were developed for troubleshooting the system. The midshipman XO took the lead and a second mechanically minded, hands-on type mid (the designated First Lt) assisted. The approach, as summarized later by the XO, is related here because it reflects a correct systematic approach to a problem. It is the right thought process and reflects a sound, big picture approach.

When we noticed a problem, we stopped to assess the situation. Too hard to pump, so we stopped to think.

We traced the system in the boat and drew a schematic diagram. Then we assessed the symptoms (water not flowing freely through the system) and considered possible points of blockage. We checked the easy and obvious things first, valves lined up correctly and nothing out of position. All checks were satisfactory. We concluded that we would have to open the system to locate / correct the reason for the blockage.

We started from the head (first in the flow path) by disconnecting the outlet hose from the head. Water flowed easily from the head itself when the pump was cycled, indicating the head and pump were not the problem.

We then probed the hose from the head to the system Y valve (next fixture in the flow path) with an improvised plumber's snake. Resistance was encountered and by measuring the length of the plumbers snake from the head to the point of resistance, it appeared the blockage was at the Y valve (sends flow overboard or to the holding tank).

The hose from the head was removed from the inlet fitting of the Y valve, the obstruction was found, removed, and then we reassembled the system. The system was tested by flushing water both to the holding tank and overboard.

Key Points:

- The plumbers "snake" was a section cut from the garden hose normally used to fill potable water tanks from shore. Improvise with what is available on board.

- The troubleshooting and repair, all within the confines of the head compartment and with the Y valve itself located inside the locker beneath the sink, were examples of grit, determination, and perseverance on the part of the repair team. It is a nasty proposition to open and work on the sanitary

system under any conditions. Additionally, here, the boat was off-shore and rolling, bouncing in 4-5 ft seas and 15 knots of wind. They persevered and succeeded!

- Including final cleanup, the head and holding tank were returned to full service about 4 hours after first recognizing the problem. The “oaken bucket” was never used – and the crew collectively breathed a huge sigh of relief.

- The blockage was a piece of “baby wipe.” Baby wipes are a useful alternative when showers / bathing are limited but they cannot be discarded through the head. The experience here underscores the standards for use of all marine heads – only human waste into the system, use only marine (dissolving) toilet paper (single ply) and generous flushing after each use.

- The materials within supermarket toilet paper, intended to make it soft and user friendly, create a soggy mass when exposed to water – a sure formula for blockage when pumping from the head and through the system. Only use single ply toilet paper in the marine head.

- Later discussions with maintenance personnel ashore after return to Santee Basin indicate the passages though the Y valve of the N44 MK II are “surprising small” in comparison to the apparent size of the valve itself. This is probably the choke point / limiting point for flow through the system.

- Training of crew members in use of the head – and marine toilet paper - are mandatory.

6.18 TOTAL LOSS OF ELECTRICAL POWER

Scenario. You are Skipper of a Navy STC proceeding up the Delaware Bay en route to Annapolis. After 1800 position reports are made and to conserve fuel, you are able to sail and can easily stay far to the right side of the channel on a port tack. Ship traffic is light and although the current is now ebbing, speed over the ground is about four knots. As you enter the Delaware River you can sail on a broad reach, although due to the increasing current effects, SOG has dropped to about three knots. Traffic is nonexistent at this time.

A storm starts to cross the river with lightning but winds stay 15-20 knots and you can carry the number three and a single reef in the main. The Navigator uses the radar sparingly to monitor the storm. The storm stays with you for about two hours but you are able to maintain visual contact with buoys and the GPS is functioning OK.

About 2200 the crew notices that both of the radios indicate that someone seems to be intermittently keying so that no communications are possible. The battery system voltage status indicator is not showing any changes to charge status no matter what electrical equipment is turned on. A quick shut down of all systems and shutting off of the rotary switches does not change any readings or correct the radio operability.

The closest Navy STC was at least ten miles behind you as of 1800. There have been a number of lightning flashes nearby so additional precautions are taken such as turning off radios and radar and instructing the crew about touching metal objects. About 0015 the storm has cleared. Although progress is slow, if the present winds hold you should be able to sail to the canal entrance.

At approximately 0100 the Navigator reports that the main radio still sounds as though someone is trying to talk on all channels. The hand held radio is now dead although it showed full charge about an hour ago.

At approximately 0115 the helmsman asks if we are supposed to be showing a tricolor light at the top of the mast. “Well yes!” A check confirms that the mast head tricolor light is out. The breaker is thrown but the light does not stay on as the breaker trips. You shift to the deck running lights with the same result.

You decide that at this point to start the engine. You discover that the engine will not turn over even if you apply all batteries. You head further out of the channel on the east side and decide it would be best to anchor and go through all systems. Attempts to keep running lights on fail. The only light on deck that will stay on is the steaming light. The spotlight which was used to illuminate buoys shortly after sunset is now discharged.

The main anchor is brought on deck and readied for use. The Navigator is instructed to keep position reports every three minutes. The current is now at full ebb and without the engine you decide to attempt to anchor under sail. Of course now some traffic appears, heading down the river. Since the wind is blowing across the tide flow stopping the boat to release the anchor is difficult.

As you recover from one attempt to anchor, you hear five blasts from a freighter because it appeared that you might go into the channel. As you turn to head back up the river the pilot on the freighter hollers to you and says “use your GD radio.” You have the useless hand held radio in your hand but decide not to throw it. Your crew has been shining the only two workable flashlights on the sails. On the fourth attempt you are able to drop the anchor at a safe distance out of the channel.

You next work on trying to figure out why the radio does not work. All systems are secured again and then turned on. The radio now works and you plug in the hand held radio to charge it.

You hear a rush of water and when you go topside you discover that the boat has swung a complete 360 and is now riding across the anchor rode. You are not able to clear it and in a few moments the anchor

line parts. You scramble the crew to hoist the main and break out the number two anchor. You are successful in anchoring but are now further down the river due to the current and closer to the channel.

You are now able to communicate with the Coast Guard and inform them of your status. You are also able to contact the Navy STC following you and arrange for them to tow you. They arrive in about two hours and successfully tow you to the marina located in the C&D Canal without further incident.

What would have done or do?

Key Points.

- What we found. After arriving at the marina and obtaining assistance from other boats and the Cutter Shed it was found that the main power line to the starter solenoid was broken although it appeared to be attached. After repair, we were able to start the engine and refuel. We were not able to correct the running light problem or to get the system voltage display to function.

- We were told that based upon weather in Annapolis and the forecast we could most likely sail down the Chesapeake Bay once out of the canal. (WRONG!) I was also told not to worry about running lights. (??) We were the last of four boats to leave the marina. We arrived safely in Annapolis at 2100. No one ever could figure out what or why we had lost power, etc. But, it was an interesting experience!

For further information on the Experiential Leadership Program, or to recommend changes to this guide please contact the Robert Crown Sailing Center:

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