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The Effectiveness Of The Puget Sound Naval Shipyard Work Control Course For Inclusion Into The NAVY-Wide Work Control Refresher Course

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**THE EFFECTIVENESS OF THE PUGET SOUND NAVAL SHIPYARD WORK
CONTROL COURSE FOR INCLUSION INTO THE NAVY-WIDE WORK
CONTROL REFRESHER COURSE**

**A Research Paper Presented to the Graduate Faculty
Department of Occupational and Technical Studies
Old Dominion University**

**In Partial Fulfillment of the Requirement for the Master of Science
Occupational and Technical Studies
Emphasis in Business and Industry**

**By
Russell E. Shiplet
March 16, 2004**

APPROVAL PAGE

Russell E. Shiplet prepared this research project under the direction of Dr. John M. Ritz in OTED 636 Research Problems in Occupational and Technical Studies. It was submitted to the Graduate Program Director as partial fulfillment of the requirements for the Degree of Master Science in Occupational and Technical Studies.

Approved By:

Dr. John M. Ritz
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Date: _____

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CHAPTER I

INTRODUCTION

United States Naval Shipyards are tasked with the repair and upkeep of all U.S. Navy ships and submarines. These repairs must be formally controlled. The ship or submarine's crewmembers have maintained this formal control, while their vessel was in upkeep. All repairs conducted at these shipyards begin with the process of request for repair paperwork. The individual division of the ship or submarine that required the repair or upgrade of their equipment developed this paperwork. This documentation was known as an Authorized Work Request (AWR) form.

The AWRs formally controlled the work conducted within each division, but the entire ship or submarine had no organization in place to maintain a centralized collection of all repair paperwork. In addition to providing AWRs for required work, it was also the responsibility of each division to propose and provide electrical and mechanical isolation for the work to be performed. These isolations provided protection from electrical shock or maneuvering of hydraulic valves to production workers conducting the repairs. Once again, the isolations were formally controlled within each division without a centralized organization to maintain the paperwork.

In January 2000, Naval Sea Command (a.k.a. NAVSEA), the overseeing government agency for all U.S. Naval Shipyards, instructed the Puget Sound Naval Shipyard (PSNS) to create a Work Control course, which would teach civilian personnel the responsibilities for formally controlling all work performed and isolations maintained while a naval vessel was at their yard in an upkeep status. This Work Control course was to change the way the U.S. Navy controlled all work aboard ships and submarines while

they were in port. The Work Control course was to set the standard for future Work Control courses at all remaining U.S. Naval Shipyards.

STATEMENT OF THE PROBLEM

The problem of this study was to determine the overall effectiveness of the Puget Sound Naval Shipyard Work Control course for use in creating a Work Control Refresher course for the U.S. Navy.

RESEARCH GOALS

The following goals provided direction in this study:

1. What portions of the Work Control course needs to be addressed in the Navy-wide Work Control Refresher course?
2. Is the practical factor training provided in the Work Control course effective to repeat in the Navy-wide Work Control Refresher course?
3. Will the learning objectives of the Work Control course need to be re-addressed for the Navy-wide Work Control Refresher course?
4. Will the final exam of the Work Control course need to be re-addressed for the Navy-wide Work Control Refresher course?

BACKGROUND AND SIGNIFICANCE

The Puget Sound Naval Shipyard (PSNS) is a leader in the field of technical training for civilians in engineering, planning and development. Created in 1986, the Technical Training code was formed to provide submarine and surface ship instruction for all major systems and subsystems that support those platforms. In addition to naval vessel system training, the Technical Training code oversees all aspects of course development,

curriculum, instructional delivery, examination administration and student record keeping for Ship Test Director and Work Control courses.

The Work Control course was developed in January of 2001. The goal of the Work Control course was to train all civilian personnel who would become part of the Work Control Group, all aspects of Work Control including the administration and maintenance of Work Authorization Forms (WAF), Tag-out Record Sheets (TORS), Technical Work Documents (TWD), TWD Record Sheets (TRS), Technical Record Tables (TRT), and authorization checklists associated with those documents. Currently, PSNS has trained 185 civilian personnel to work for a Centralized Work Control Team (CWCT). These CWCTs are assigned shipyard projects that are contracted by PSNS. A typical contract (referred to as “projects”) consists of extended repairs and upgrades to submarines and surface ships of the United States Navy fleet.

When submarines and surface ships enter the shipyard they are placed into an upkeep status while the contracted work is underway. The upkeep normally runs from nine to 12 months. During this time equipment is removed, repaired, reinstalled and tested. The paperwork to authorize the repairs and testing are created and coordinated by Work Control Team Representatives. As a project progresses, problems arise during the removal, repair, reinstallation or testing of the equipment. When a problem occurs a Problem Incident Report (PIR) is created.

These PIRs are used to identify and critique the source of the problem and create a solution to fix the problem. The Work Control course was developed to help decrease the number of PIRs per project. The Work Control course concentrates on recent PIRs and changes to the Work Control process since its inception in 2001. This research will

determine the effectiveness of the original Work Control course in creating and Navy-wide Work Control Refresher course. In doing this it will create a universal process for all United State Navy shipyards to follow within the Work Control environment.

LIMITATIONS

This research has the following limitations. The research was limited to:

1. The Puget Sound Naval Shipyard.
2. Civilian employees working for Code 200 within the Puget Sound Naval Shipyard.
3. The Work Control course, which was offered on an as needed basis for new civilian employees hired into the shipyard.
4. The Work Control course, which included a current curriculum with lectures, practical factors, daily quizzes and final examination.
5. An enrollment of 10 students for each convening session.

ASSUMPTIONS

In this research, several assumptions were made regarding the problem being studied:

1. The Work Control course actually taught the students how to perform the duties of a Work Control Group team member.
2. Each graduate of the Work Control course would become a Work Control Group team member for a particular project.
3. Each graduate of the Work Control course would remain qualified as a Work Control Group team member for two years. At the completion of the two-year qualification, the Work Control employee would attend a Work Control Refresher course.

4. The students of the Work Control course were not paid any additional monies to complete the class.
5. If students of the Work Control course were already familiar with the Work Control process, they would gain additional skills necessary to become a team member of a Work Control Group.

PROCEDURES

The descriptive method of research was used to gather and analyze the data necessary for the study of this problem. A survey was conducted to obtain opinions from primary sources. Research data was collected from 31 students who had recently participated in the Puget Sound Naval Shipyard Work Control course through the use of that survey.

The students were surveyed as to the effectiveness of the Work Control course learning objectives and practical factors using the Likert scale technique for each survey question. The students were also questioned about the final examination. In the survey, the students were asked about the relevance of the exam questions as they related to the actual material taught in the class.

The results of this research were provided to the Puget Sound Naval Shipyard Code 246 Branch Manager and the Work Control Branch Manager who evaluated the surveys for future course development of the Navy-wide Work Control Refresher course.

DEFINITION OF TERMS

For the purposes of this research, the following terms assisted in the understanding of this study:

1. **Authorized Work Request (AWR)** – a form used by a submarine or surface ship to request work to be conducted by a shipyard facility.
2. **Centralized Work Control Team (CWCT)** – a combination of civilian Work Control and Navy ship's force personnel, which control work authorization and tag-out isolations.
3. **Code 200** – the Engineering and Planning Department code for Puget Sound Naval Shipyard in Bremerton, WA.
4. **Isolation** – a means of providing protection to personnel and equipment that are conducting authorized work. This protection is in the form of information tags hung on valves, switches and fuses, which are placed in the "OFF" position.
5. **Practical Factor** – a hands-on exercise, which gives students simulated Work Control experience with Work Authorization Forms and associated documents.
6. **Problem Incident Report (PIR)** – a document used to record and track problems that occur associated with authorized work.
7. **Tag-out Record Sheet (TRS)** – a document used to authorize and track isolation for authorized work.
8. **Technical Work Document (TWD)** – a form that gives specific instructions to remove, repair, reinstall and test submarine and surface ship equipment.
9. **Technical Word Document Record Sheet (TRS)** – a tracking sheet for all Technical Work Documents associated with authorized work.
10. **Technical Work Document Release Table (TRT)** – a form used as a cover sheet to formal release authorized work.

11. **Work Authorization Form (WAF)** – a document used by the Work Control Group to create, authorize, track, and closeout work on board submarines and surface ships.
12. **Work Control Group (WCG)** – a group of civilian employees who are qualified as Work Controls. Work Control Groups are formed and teamed up with ship's force personnel to create the Centralized Work Control Team for each submarine or surface ship project.
13. **Work Control Representative**– a graduate of the Work Control course who is a member of a Work Control Group.
14. **Work Control Course** – a 40-hour course of instruction, which includes lectures, practical factors, daily quizzes and final examination for students seeking to become members of a Work Control Group.
15. **Work Control Refresher Course** – a 12-hour course of instruction, which includes lectures, practical factors, quiz and final examination for previous graduates of the Work Control course whose initial qualification is nearing the end of their 2-year qualification.

OVERVIEW OF CHAPTERS

Chapter I of this research determined the overall effectiveness of the Work Control course at Puget Sound Naval Shipyard, as a means of establishing a Navy-wide Work Control Refresher course. Chapter II focused on the review of existing literature on training effectiveness, which was necessary to explore the possibilities of creating a Work Control Refresher course using previous learning objectives, lectures, practical factors, quizzes and exams conducted within the Work Control course.

Chapter III explained the methods and procedures used to collect the data. Chapter IV presents and interprets the results of the surveys and interviews used in Chapter III. Chapter V summarizes this research study. Conclusions are stated and recommendations are suggested in this final chapter.

CHAPTER II

REVIEW OF LITERATURE

In the October 1993 edition of *Training Magazine*, seven steps for creating and conducting successful training programs were listed (Broadwell, 1993, pp. 75-81).

Although dated, each of the seven steps is still pertinent to today's classroom environment. The seven steps include:

1. Conduct a thorough needs analysis to identify organizational deficiencies and analyze the potential for training to overcome the deficiencies and assess trainee willingness and ability to learn the material.
2. Prepare a clearly written set of behavioral objectives that enable trainees, their supervisors, and the program managers to understand what the program will cover.
3. Develop the curriculum. Training should focus on the knowledge and skills needed to master the performance objectives.
4. Determine the delivery method, job aids, and other training materials. Learning should be purposeful and actively involve the trainees.
5. Develop a program agenda that delineates where and for how long the program will run.
6. Conduct the training using the performance objectives. Keeping training focused on the objectives will ensure the program stays on track.
7. Evaluation. Evaluate the program's effectiveness in translating the learning to improved work skills. Were the trainees able to perform the objectives? Were deficiencies identified in the needs analysis addressed?

For the Work Control course, each of these steps is relevant to its development, delivery and maintenance. Step 1 speaks of needs analysis. The needs analysis is mandated by NAVSEA instruction (JFFM, 2002, p. 103). The Work Control course will be required of all shipyards by 2005. PSNS is the test platform for the course. Step 2 talks of setting behavioral objectives for the course. Learning objectives are laid out at the beginning of the first lecture. Students understand what instruction they will receive and the measure used to evaluate their comprehension of the material presented.

Curriculum is developed once the objectives of the course have been determined. This is established during the planning stages of the initial course development. This falls in line with Step 3. Step 4 suggests that the delivery method of the material be determined to keep the training purposeful and the trainee interested. The PSNS Work Control course uses PowerPoint slide shows to present lectures. Eleven practical factors are covered over the course of the convening to fully engage the trainees into a Work Control Group environment. Step 5 speaks of creating a program agenda. This is done during the initial planning stages of the course so that the class length and convening frequencies can be determined and administered early on. Step 6 talks of training to the objectives. The Work Control course must adhere to the learning objectives so that students are not confused by what they are told they will learn at the beginning of the course and what they actually learn through the duration of the course. Finally, Step 7 speaks of course evaluation. The Work Control course evaluates the effectiveness and the efficiency of the class through student surveys and inputs for course improvement and enhancement.

In addition to adherence of the seven steps suggested by Broadwell (1993), the Puget Sound Naval Shipyard is also required to adhere to local and national instruction mandated by Code 200 and NAVSEA. The Puget Sound Naval Shipyard (PSNS) Work Control Local Instruction (WC-02), NAVSEA Joint Fleet Maintenance Manual (JFFM) and the NAVSEA Tag-out User's Manual (TUM) are all referenced to ensure that curriculum and objectives fulfill minimum requirements for course development.

LOCAL INSTRUCTION

The local instruction used by PSNS Work Control Group (WCG) members is the Work Control Local Instruction or WC-02. The WC-02 designator indicates that the instruction for implementing and maintaining the WCG process is located in Chapter 2 of the Work Control Local Instruction. Within WC-02, instruction for opening, maintaining, placing on hold and closing Work Authorization Forms (WAFs) is described in detail (WC-02, 2003, pp. 1-36). The WAFs are used to formally control and safely authorize work within any project at the shipyard. The Joint Fleet Maintenance Manual (JFFM), which will be discussed later in this chapter, governs the use of WAFs on all U.S. Navy vessels. WC-02 uses the JFFM to establish the foundation for the local instruction.

In addition to dictated instruction for the use of WAFs, WC-02 also gives guidance for the use of:

- All Checklists
- Mapping Boards
- Technical Work Documents (TWDs)

- TWD Record Sheets (TRSs)
- TWD Release Tables (TRTs)
- Tag-out isolation requirements in accordance with the NAVSEA Tag-out User's Manual (TUM)

The TUM is discussed later in this chapter as well and governs the use of Tag-out Record Sheets (TORS), Danger and Caution Tags, and ship system isolation considerations. WC-02 uses the TUM to establish the system isolation local instruction.

The WC-02 Local Instruction has been used to assist in the creation of the PSNS Work Control course. Since WC-02 is a local instruction, it speaks to specific issues only pertinent to PSNS. Each U.S. Navy shipyard will have to create their own Work Control Local Instruction to address the issues, which are unique to their own project situation(s).

During the creation of the initial Work Control course, WC-02, the JFFM and TUM were all used extensively to create the Work Control course outline, learning objectives and curriculum. Each shipyard will need to refer to its version of WC-02, and the NAVSEA JFFM and TUM instructions to develop their own Work Control course.

NAVSEA JOINT FLEET MAINTENANCE MANUAL

The NAVSEA Joint Fleet Maintenance Manual is more commonly referred to as the JFFM (pronounced "Jiff em"). The JFFM is a U.S. Navy fleet-wide instruction, which gives direction to new construction, integrated fleet maintenance, deployed maintenance, tests, inspections and special application maintenance programs and quality maintenance procedures. In addition, the JFFM addresses Quality Assurance (QA) forms as well as Work Control WAF guidelines and TWD preparation instructions.

The JFFM sets the standard for all shipyards to adhere to in regard to project work.

The JFFM is used as a guide for:

- Constructing new Naval vessels
- Maintaining incorporated fleet-wide maintenance and upkeep
- Testing, inspections, special maintenance applications such as one-of-a-kind equipment installations and upkeep
- Quality maintenance procedures
- Work Control WAF creation, maintenance and closure procedures.

The JFFM was referred to extensively when the PSNS WC-02 1st Edition was created. Since the JFFM is periodically updated, the WC-02 local instruction is restructured to ensure it contains the most recent fleet-wide guidelines as it pertains to Work Control in general.

Even though the JFFM is the overseeing document for Navy-wide vessels and shipyards, NAVSEA command inspects local instructions for ideas that may be adaptable within the next JFFM change. When local instructions are written, they use the JFFM to lay the foundation for the instruction and then add local specifications that are unique to their own situation. These NAVSEA inspections look at each unique situation to see if commonality is found amongst all shipyards. If so, a change to the JFFM may be in order and implemented on a fleet-wide basis.

The PSNS Work Control course is in a continuous state of flux since local and fleet-wide instructions change constantly. Once additional shipyards adopt their own version of the Work Control course, they will need to be mindful of these changes and make adjustments to the curriculum accordingly.

NAVSEA TAG-OUT USER'S MANUAL

The Tag-out User's Manual, TUM (pronounced "Tum"), is considered to be the single most important fleet-wide instruction in use today by all U.S. Navy vessels and shipyard commands. The TUM is the over-seeing instruction for ship system isolation procedures. These procedures give guidance to:

- Identifying ship system components
- Isolation points for components
- Instructions for shutting off components at the isolation points
- Danger tag-out procedures for tagging isolation points
- Log recording procedures for each danger tagged component

Strict adherence to the TUM is required by all shipyard and Navy personnel to ensure a safe working condition for both individual and equipment. Since the Work Control WAF formally controls and safely authorizes work, WC-02 uses the TUM when addressing isolation issues of any shipyard project. The PSNS Work Control course includes lectures dedicated to project isolation topics and fleet-wide lessons learned. These lesson-learned presentations bring realism to the course and give students an opportunity to see what can, and will go wrong on a project when the NAVSEA guidance and local instruction are not adhered to.

The TUM is rarely changed or amended. The standard that is established is based on common laws of electricity, pressure and gravity. As part of the development stage of any Work Control course, at a minimum, the JFFM and the TUM should be used as the underpinning for any local instruction written.

WORK CONTROL COURSE SURVEY

There was one Work Control course survey, divided into three sub-sections, which were implemented in each class. The survey was used to determine whether or not the learning objectives of the course were met, the intent of the hands-on practical factors were met, and whether or not the final examination was an adequate measure of the students overall knowledge of the course. The learning objectives consisted of sixteen basic knowledge concepts and models as they pertain to Work Control within the Puget Sound Naval Shipyard. The practical factor exercises consisted of students generating WAFs, using checklists to ensure adherence to instruction, and proposing of ship system isolation for the work described within the WAF. The final examination was developed to measure the students' ability to retain the learning objectives and practical factor exercises as laid out with the Work Control course curriculum.

This survey revealed that the learning objectives were, in deed, met and that the hands-on practical factors met the intent of the training. The final examination survey question revealed that the exam was a true measure of the entire course, and therefore, did not need to be re-addressed for the Navy-wide Work Control Refresher course. These survey results have been generalized in this chapter and will be addressed in greater detail, in Chapter III of this study.

SUMMARY

The PSNS Work Control course is required to meet a certain standard that is established by internal local instruction and external sources outside the shipyard. These sources give guidance and direction to the foundation of the course. Since the PSNS

Work Control course strives to adhere to all instructions, fleet-wide and local, it is hopeful that this course sets the standard for all shipyards to meet once they begin their own development and implementation of the Work Control Refresher course. If a dated guideline to course development is any measure of how successful a class can be the PSNS Work Control course appears to be well on its way to a successful run at the shipyard.

CHAPTER III

METHODS AND PROCEDURES

The purpose of this study was to determine what aspects of the Puget Sound Naval Shipyard Work Control Course provided effective training to shipyard employees and what portions of that training need to be included in all United States Navy shipyards world-wide. Research goals used to support this study included determining the effectiveness of learning objectives, practical factor exercises and final examination methods that would need to be re-addressed or included in the Navy-wide Work Control Refresher course. Survey instruments were used to gather data from the PSNS Work Control Course graduates to support these objectives. This chapter discusses the methods and procedures that were used to identify the course tasks and complete the study's research goals.

POPULATION

Mechanical and Electrical Engineers, U.S. Navy retired personnel and contractors from Electric Boat Company comprised the population of this study. Respondents in that population were further grouped into three stratified populations. Those included:

1. Recent college graduates with engineering degrees hired into PSNS in 2003 to work a variety of professional jobs including project Work Control Groups (up to 15 respondents).
2. Recently retired U.S. Navy personnel who were hired into PSNS in 2003 to work specifically for project Work Control Groups (up to 12 respondents).

3. Electric Boat Company contractors hired into PSNS in 2003 to work the USS Ohio and USS Michigan Work Control Groups (up to 4 respondents).

It was assumed that the surveyed population would be representative of the U.S. Navy shipyard community worldwide and would provide the researcher with valid data regarding Work Control Course training conditions within those communities.

INSTRUMENT DESIGN

PSNS Code 241.1 Technical Training course evaluation forms were used to survey the Work Control Course graduates. Key questions related to the course tasks were included in all surveys in order to determine their applicability for inclusion in the navy-wide course. The Work Control Course graduates were queried about the effectiveness of the course layout, the hands-on practical factors and the relevance and measure of comprehension using the final examination as the instrument of that measure.

This survey consisted of a five-point scale for each question. The survey required each respondent to make a value judgment (Likert scale) regarding whether they Strongly Agreed, Agreed, Neither Agreed or Disagreed, Disagreed or Strongly Disagreed with each of the survey questions. Questions ranged from how well the respondent felt that the learning objectives were met to how effective they felt the hands-on practical factors were and how efficient the final examination measured their overall knowledge of what was taught to them while enrolled in the course. A sample of the survey is included in Appendices A and B of this study.

METHODS OF DATA COLLECTION

The researcher recently provided Work Control Course training to three separate groups of students in 2003; the audience for this survey consisted of those students. Over the duration of the three class convenings, 31 students graduated from the Work Control Course. Ten students were in each of the first two course convenings, 11 students were enrolled in the last Work Control Course given in 2003. All three groups of students surveyed matched the demographics mentioned in the population section of this chapter. The researcher informed each student that the survey was strictly voluntary and provided a brief explanation of the rationale for the study. The surveys were sent to each student via guard mail through the PSNS inner mail system along with a cover letter explaining the purpose for the survey and instructions for properly filling out the form. In addition, directions were provided for sending the surveys back to the researcher in a timely manner. The researcher asked that the surveys be returned within five working days from time of receipt. A follow on letter was sent to respondents who did not return the survey within ten working days of receipt. A copy of the cover letter and follow on letter is included in Appendices C and D of this study.

STATISTICAL ANALYSIS

Data were tabulated and analyzed based on the results of the survey. Average course survey means were computed by determining the means for each survey question.

SUMMARY

This chapter discussed the methods and procedures that were used to gather data related to the development of a navy-wide Work Control Refresher course. Surveys were used as the primary data collection tool. Chapter IV provides the survey results.

CHAPTER IV

FINDINGS

The purpose of this study was to determine what aspects of the Puget Sound Naval Shipyard Work Control course provided effective training to shipyard employees and what portions of that training would be included in all United States Naval Shipyard Work Control Refresher courses world-wide. Course learning objectives, practical factors and final course examination validity were identified by surveying a population of 31 Puget Sound Naval Shipyard employees who attended the three most recent convenings of the Work Control course in 2004. One hundred percent of the course convening population responded to the surveys. The population consisted of fifteen mechanical and electrical engineers, twelve recently-retired U.S. Navy personnel hired into the shipyard in 2003, and four Electric Boat Corporation contractors who were working at the shipyard on specific submarine projects. The number of respondents sufficiently represented the United States Navy shipyard community given the small size of Work Control course student population.

WORK CONTROL COURSE SURVEY LEARNING OBJECTIVES

Graduates of the Work Control course evaluated sixteen learning objectives as they pertained to the gained knowledge of basic Work Control concepts and models. Respondents rated these learning objectives using a Likert scale technique, which included “Strongly Agree”, “Agree”, “Neither Agree or Disagree”, “Disagree”, or “Strongly Disagree” as possible responses. Table 1 displays the learning objectives

criteria and respondent percentages for the survey population. Table 2 refers to the actual respondent choice and the calculated mean for each Learning Objective listed in Table 1.

Appendix A contains the Work Control course Learning Objectives Survey.

Table 1. Work Control Course Learning Objectives Criteria and Respondent Percentages

Learning Objective	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Basic understanding of...					
1. Takedown Strategies	52%	48%	0%	0%	0%
2. Mapping Boards	61%	39%	0%	0%	0%
3. Work Authorization Form Preparation	52%	48%	0%	0%	0%
4. Tag-out Proposal Preparation	61%	39%	0%	0%	0%
5. Tag-out Review Procedures	61%	39%	0%	0%	0%
6. Work Authorization Form Processes	48%	42%	10%	0%	0%
7. Linking TWDs to WAFs	68%	32%	0%	0%	0%
8. Process to Release Work	61%	32%	7%	0%	0%
9. Process to Close Work	52%	48%	0%	0%	0%
10. Closing Tag-outs and WAFs	68%	32%	0%	0%	0%
11. Modifying WAFs	61%	39%	0%	0%	0%
12. Setting System Conditions (3Ds)	68%	32%	0%	0%	0%
13. Shifting Isolations	68%	32%	0%	0%	0%
14. Work Control Responsibilities	52%	48%	0%	0%	0%
15. Placing Work on Hold	61%	32%	7%	0%	0%
16. Posted Tag Checker Procedures	84%	16%	0%	0%	0%

Table 2. Work Control Course Learning Objective Criteria and Respondent Individual Choice

Learning Objective	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	Mean*
Basic understanding of...	(5 pts)	(4 pts)	(3pts)	(2pts)	(1 pt)	(Based on 5 pt scale)
1. Takedown Strategies	16	15	0	0	0	4.5
2. Mapping Boards	19	12	0	0	0	4.5
3. Work Authorization Form Preparation	16	15	0	0	0	4.5
4. Tag-out Proposal Preparation	19	12	0	0	0	4.5
5. Tag-out Review Procedures	19	12	0	0	0	4.5
6. Work Authorization Form Processes	15	13	3	0	0	4.0
7. Linking TWDs to WAFs	21	10	0	0	0	4.5
8. Process to Release Work	19	10	2	0	0	4.0
9. Process to Close Work	16	15	0	0	0	4.5
10. Closing Tag-outs and WAFs	21	10	0	0	0	4.5
11. Modifying WAFs	19	12	0	0	0	4.5
12. Setting System Conditions (3Ds)	21	10	0	0	0	4.5
13. Shifting Isolations	21	10	0	0	0	4.5
14. Work Control Responsibilities	16	15	0	0	0	4.5
15. Placing Work on Hold	19	10	2	0	0	4.0
16. Posted Tag Checker Procedures	26	5	0	0	0	4.5

*Mean is the average of the highest and the lowest point values selected for each question

NARRATIVE ON LEARNING OBJECTIVES SURVEY QUESTIONS

Question 1. Takedown Strategies. Of the thirty-one surveyed Work Control Course graduates, 52% “Strongly Agree” and 48% “Agree” that they gained a basic understanding of the submarine system takedown strategy as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that the learning objective was met.

Question 2. Mapping Boards. Of the thirty-one surveyed Work Control Course graduates, 61% “Strongly Agree” and 39% “Agree” that they gained a basic understanding of the mapping board procedures as they relate to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that the learning objective was met.

Question 3. Work Authorization Form Preparation. Of the thirty-one surveyed Work Control Course graduates, 52% “Strongly Agree” and 48% “Agree” that they gained a basic understanding of the Work Authorization Form preparation procedure as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that the learning objective was met.

Question 4. Tag-out Proposal Preparation. Of the thirty-one surveyed Work Control Course graduates, 61% “Strongly Agree” and 39% “Agree” that they gained a basic understanding of the tag-out proposal preparation procedure as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that the learning objective was met.

Question 5. Tag-out Review Procedures. Of the thirty-one surveyed Work Control Course graduates, 61% “Strongly Agree” and 39% “Agree” that they gained a basic

understanding of the tag-out review procedures as they relate to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that the learning objective was met.

Question 6. Work Authorization Form Processes. Of the thirty-one surveyed Work Control Course graduates, 48% “Strongly Agree,” 42% “Agree,” and 10% “Neither Agree or Disagree” that they gained a basic understanding of the Work Authorization Form processing as it relates to Work Control. The calculated mean for this question was 4.0 on a 5.0 scale. Based upon the 4.0 mean score, the respondents agreed that the learning objective was met.

Question 7. Linking TWDs to WAFs. Of the thirty-one surveyed Work Control Course graduates, 68% “Strongly Agree” and 32% “Agree” that they gained a basic understanding of linking Technical Work Documents (TWDs) to Work Authorization Forms (WAFs) as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that the learning objective was met.

Question 8. Process to Release Work. Of the thirty-one surveyed Work Control Course graduates, 61% “Strongly Agree,” 32% “Agree,” and 7% “Neither Agree or Disagree” that they gained a basic understanding of the process to release work as it relates to Work Control. The calculated mean for this question was 4.0 on a 5.0 scale. Based upon the 4.0 mean score, the respondents agreed that the learning objective was met.

Question 9. Process to Close Work. Of the thirty-one surveyed Work Control Course graduates, 52% “Strongly Agree” and 48% “Agree” that they gained a basic understanding of the process to close work as it relates to Work Control. The calculated

mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that the learning objective was met.

Question 10. Closing Tag-outs and WAFs. Of the thirty-one surveyed Work Control Course graduates, 68% “Strongly Agree” and 32% “Agree” that they gained a basic understanding of closing tag-outs and WAFs as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that the learning objective was met.

Question 11. Modifying WAFs. Of the thirty-one surveyed Work Control Course graduates, 61% “Strongly Agree” and 39% “Agree” that they gained a basic understanding of modifying WAFs as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that the learning objective was met.

Question 12. Setting System Conditions (3Ds). Of the thirty-one surveyed Work Control Course graduates, 68% “Strongly Agree” and 32% “Agree” that they gained a basic understanding of setting the system conditions of the ship (establishing the 3Ds: Drain, Depressurize, De-energize) as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that the learning objective was met.

Question 13. Shifting Isolation. Of the thirty-one surveyed Work Control Course graduates, 68% “Strongly Agree” and 32% “Agree” that they gained a basic understanding of shifting system isolation as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that the learning objective was met.

Question 14. Work Control Responsibilities. Of the thirty-one surveyed Work Control Course graduates, 52% “Strongly Agree” and 48% “Agree” that they gained a basic understanding of Work Control Responsibilities. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that the learning objective was met.

Question 15. Placing Work on Hold. Of the thirty-one surveyed Work Control Course graduates, 61% “Strongly Agree,” 32% “Agree,” and 7% “Neither Agree or Disagree” that they gained a basic understanding of the process to place work on hold as it relates to Work Control. The calculated mean for this question was 4.0 on a 5.0 scale. Based upon the 4.0 mean score, the respondents agreed that the learning objective was met.

Question 16. Posted Tag Checker Procedures. Work Control Responsibilities. Of the thirty-one surveyed Work Control Course graduates, 84% “Strongly Agree” and 16% “Agree” that they gained a basic understanding of the posted tag checker procedures as they relate to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that the learning objective was met.

WORK CONTROL COURSE SURVEY PRACTICAL FACTORS

Graduates of the Work Control Course evaluated eleven practical factors as they related to basic Work Control practices and procedures. Respondents rated these practical factors using a Likert scale technique, which included “Strongly Agree,” “Agree,” “Neither Agree or Disagree,” “Disagree,” or “Strongly Disagree” as possible responses. Table 3 displays the practical factor criteria and respondent percentages for

the survey population. Table 4 refers to the actual respondent choice and the calculated mean for each practical factor listed in Table 3. Appendix B contains the Work Control Course Practical Factor Survey.

Table 3. Work Control Course Practical Factor Criteria and Respondent Percentages

Practical Factor	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Basic skills to properly ...					
17. Prepare a Component WAF	32%	68%	0%	0%	0%
18. Prepare a System Transfer WAF	32%	61%	7%	0%	0%
19. Prepare an Isolation Proposal for a Component WAF	68%	32%	0%	0%	0%
20. Perform Posted Tag Checker Duties	61%	39%	0%	0%	0%
21. Open a Component WAF	52%	48%	0%	0%	0%
22. Authorize and Map Work Associated with a System Transfer WAF	19%	74%	7%	0%	0%
23. Place Work on HOLD Associated with a System Transfer WAF	42%	52%	6%	0%	0%
24. Revise Isolation Associated with a Component WAF	45%	55%	0%	0%	0%
25. Close Out Completed Work Associated with a Component WAF	45%	55%	0%	0%	0%
26. Clear Isolation Associated with a Component WAF	45%	55%	0%	0%	0%
27. Close a Component WAF	29%	71%	0%	0%	0%

Table 4. Work Control Course Practical Factor Criteria and Respondent Individual Choice

Practical Factor Basic skills to properly...	Strongly Agree (5 pts)	Agree (4 pts)	Neither Agree or Disagree (3 pts)	Disagree (2 pts)	Strongly Disagree (1 pt)	Mean* (Based on 5 pt scale)
17. Prepare a Component WAF	10	21	0	0	0	4.5
18. Prepare a System Transfer WAF	10	19	2	0	0	4.0
19. Prepare an Isolation Proposal for a Component WAF	21	10	0	0	0	4.5
20. Perform Posted Tag Checker Duties	19	12	0	0	0	4.5
21. Open a Component WAF	16	15	0	0	0	4.5
22. Authorize and Map Work Associated with a System Transfer WAF	15	13	3	0	0	4.0
23. Place Work on HOLD Associated with a System Transfer WAF	6	23	2	0	0	4.0
24. Revise Isolation Associated with a Component WAF	14	17	0	0	0	4.5
25. Close Out Completed Work Associated with a Component WAF	14	17	0	0	0	4.5
26. Clear Isolation Associated with a Component WAF	14	17	0	0	0	4.5
27. Close a Component WAF	9	22	0	0	0	4.5

*Mean is the average of the highest and the lowest point values selected for each question

NARRATIVE ON PRACTICAL FACTOR SURVEY QUESTIONS

Question 17. Prepare a Component WAF. Of the thirty-one surveyed Work Control Course graduates, 32% “Strongly Agree” and 68% “Agree” that they gained the basic skills to properly prepare a component WAF as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score,

the respondents strongly agreed that they gained the basic skills required for this practical factor.

Question 18. Prepare a System Component WAF. Of the thirty-one surveyed Work Control Course graduates, 32% “Strongly Agree,” 61% “Agree,” and 7% “Neither Agree or Disagree” that they gained the basic skills to properly prepare a system transfer WAF as it relates to Work Control. The calculated mean for this question was 4.0 on a 5.0 scale. Based upon the 4.0 mean score, the respondents agreed that they gained the basic skills required for this practical factor.

Question 19. Prepare an Isolation Proposal for a Component WAF. Of the thirty-one surveyed Work Control Course graduates, 68% “Strongly Agree” and 32% “Agree” that they gained the basic skills to properly prepare an isolation proposal for a component WAF as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that they gained the basic skills required for this practical factor.

Question 20. Posted Tag Checker Duties. Of the thirty-one surveyed Work Control Course graduates, 61% “Strongly Agree” and 39% “Agree” that they gained the basic skills to conduct the posted tag checker duties as they relate to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that they gained the basic skills required for this practical factor.

Question 21. Open a Component WAF. Of the thirty-one surveyed Work Control Course graduates, 52% “Strongly Agree” and 48% “Agree” that they gained the basic skills to open a component WAF as it relates to Work Control. The calculated mean for

this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that they gained the basic skills required for this practical factor.

Question 22. Authorize and Map Work Associated with a System Transfer WAF. Of the thirty-one surveyed Work Control Course graduates, 19% “Strongly Agree,” 74% “Agree,” and 7% “Neither Agree or Disagree” that they gained the basic skills to authorize and map work associated with a system transfer WAF as it relates to Work Control. The calculated mean for this question was 4.0 on a 5.0 scale. Based upon the 4.0 mean score, the respondents agreed that they gained the basic skills required for this practical factor.

Question 23. Place Work on HOLD associated with a system transfer WAF. Of the thirty-one surveyed Work Control Course graduates, 42% “Strongly Agree,” 52% “Agree,” and 6% “Neither Agree or Disagree” that they gained the basic skills to place work on HOLD associated with a system transfer WAF as it relates to Work Control. The calculated mean for this question was 4.0 on a 5.0 scale. Based upon the 4.0 mean score, the respondents agreed that they gained the basic skills required for this practical factor.

Question 24. Revise Isolation Associated with a Component WAF. Of the thirty-one surveyed Work Control Course graduates, 45% “Strongly Agree” and 55% “Agree” that they gained the basic skills to revise isolation associated with a component WAF as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that they gained the basic skills required for this practical factor.

Question 25. Close Out Completed Work Associated with a Component WAF. Of the thirty-one surveyed Work Control Course graduates, 45% “Strongly Agree” and 55% “Agree” that they gained the basic skills to close out completed work associated with a component WAF as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that they gained the basic skills required for this practical factor.

Question 26. Clear Isolation Associated with a Component WAF. Of the thirty-one surveyed Work Control Course, graduates 45% “Strongly Agree” and 55% “Agree” that they gained the basic skills to clear isolation associated with a component WAF as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that they gained the basic skills required for this practical factor.

Question 27. Close a Component WAF. Of the thirty-one surveyed Work Control Course graduates, 29% “Strongly Agree” and 71% “Agree” that they gained the basic skills to close a component WAF as it relates to Work Control. The calculated mean for this question was 4.5 on a 5.0 scale. Based upon the 4.5 mean score, the respondents strongly agreed that they gained the basic skills required for this practical factor.

WORK CONTROL COURSE SURVEY FINAL EXAMINATION

Graduates of the Work Control Course evaluated the final examination as it related to learning objectives, practical factors and content coverage during the class convening. Respondents rated the final exam using a Likert scale technique, which included “Strongly Agree,” “Agree,” “Neither Agree or Disagree,” “Disagree, or Strongly

Disagree” possible responses. Table 5 displays the final examination criteria and respondent percentages for the survey population. Table 6 refers to the actual respondent choice and the calculated mean for the final examination criteria listed in Table 5.

Appendix B contains the Work Control Course Final Examination Survey.

Table 5. Work Control Course Final Examination Criteria and Respondent Percentages

Final Examination	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Adequately measured...					
28. My Overall Knowledge of the Work Control Course Content	71%	29%	0%	0%	0%

Table 6. Work Control Course Final Examination Criteria and Respondent Individual Choice

Final Examination	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	Mean*
Adequately measured...	(5 pts)	(4 pts)	(3 pts)	(2 pts)	(1 pt)	(Based on a 5pt scale)
28. My Overall Knowledge of the Work Control Course Content	22	9	0	0	0	4.5

*Mean is the average of the highest and the lowest point values for each question

NARRATIVE ON FINAL EXAMINATION SURVEY QUESTION

Question 28. Overall Knowledge of the Work Control Course Content. Of the thirty-one surveyed Work Control course graduates, 71% “Strongly Agree” and 29% “Agree” that the final examination adequately measured their overall knowledge of the Work Control course content. The calculated mean for this question was 4.5 on a 5.0 scale.

Based upon the 4.5 mean score, the respondents strongly agreed that the final examination adequately measured their overall knowledge of the Work Control course.

SUMMARY

This chapter presented data from surveys given to recent graduates of the Puget Sound Naval Shipyard Work Control course. Graduates evaluated the learning objectives, practical factors and final examination as they related to the course. Respondent percentages, individual responses and the calculated mean for each of the evaluated criteria were summarized via Tables 1-6. The intent of the survey was to determine the overall effectiveness of the Work Control course as it relates to Work Control for shipyard projects. For each of the sixteen Learning Objectives, a majority of the graduates surveyed indicated that the learning objectives of the Work Control course were met. For each of the eleven practical factors, a majority of the graduates surveyed indicated that the intent of each practical factor was met. For the Final Examination survey question, one hundred percent of the graduates surveyed indicated that the final examination was an accurate measurement of the acquired knowledge gained in the Work Control course.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Chapter V summarizes the findings of this research study. It reports the conclusions and makes recommendations regard the research problem and goals.

SUMMARY

The problem of this research study was to determine the overall effectiveness of the Puget Sound Naval Shipyard Work Control course for use in creating a Work Control Refresher course for the United States Navy. Completing four research goals enabled the researcher to make conclusions and recommendations regarding the research problem. Information related to the problem statement and research goals was collected from Work Control course graduates through a single survey, divided into three sub-sections: learning objectives, practical factors and final examination. Thus, the data accurately reflected the opinions of Work Control course respondents. The overwhelming majority of those respondents are actively engaged in the performance of Work Control assignments as they relate to projects within the Puget Sound Naval Shipyard.

Surveys were given to thirty-one recent graduates of the Work Control course. The graduates were asked to evaluate the sixteen learning objectives of the course as to the basic knowledge they gained for each objective. The survey also asked each graduate to evaluate the eleven practical factors of the course as to the basic skills they gained from each of those practical factors. Finally, the survey asked each graduate to evaluate the

final examination of the course as to the adequacy of measurement for his or her overall knowledge of the Work Control course content.

CONCLUSIONS

Several conclusions that are particularly pertinent to the research study can be drawn from the tabulated data and applied to the research goals. Research goals are listed with supporting conclusions. General conclusions that are pertinent to the research study's problem are also provided.

1. What portions of the Work Control course needs to be readdressed in the Navy-wide Work Control Refresher course? No clear trend emerged from the data to identify portions of the Work Control course that required immediate performance intervention. However the serious nature of properly performing Work Control functions mandates superb performance of the designated tasks since the risk of safety mishaps to personnel and/or equipment can result from improper performance of those tasks. With the exception of Learning Objective 6 (Work Authorization Form Processes), Learning Objective 8 (Process to Release Work), Learning Objective 15 (Placing Work on Hold), Practical Factor 18 (Prepare a System Transfer WAF), Practical Factor 22 (Authorizing and Map Work Associated with a System Transfer WAF), and Practical Factor 23 (Place Work on HOLD Associated with a System Transfer WAF), the graduates identified proficiency/training adequacy at a mean of 4.5 based on a 5.0 scale. Of the three learning objectives and three practical factors (mentioned above) where the graduates did not identify proficiency/training adequacy of 4.5 or higher, the mean was calculated at 4.0 based on a 5.0 scale. The calculated mean for the final examination reflected a

proficiency/training adequacy of 4.5 based on a 5.0 scale. These calculated mean scores for each learning objective, practical factor and final examination indicated that each graduate of the Work Control course achieved a high amount of proficiency/training adequacy. The researcher concludes that there are no portions of the Work Control course that needed to be readdressed in the Navy-wide Work Control Refresher course.

2. Is the practical factor training provided in the Work Control course effective to repeat in the Navy-wide Work Control Refresher course? The practical factors included in the Work Control course are intended to give students hands-on training in the creation, maintenance and closure of Work Authorization Forms and associated tag-outs, mapping boards, Technical Work Documents and checklists found in a typical Work Control Group environment. With the exception of Practical Factor 18 (Prepare a System Transfer WAF), Practical Factor 22 (Authorizing and Map Work Associated with a System Transfer WAF) and Practical Factor 23 (Place Work on HOLD Associated with a System Transfer WAF), the graduates identified proficiency/training adequacy at a mean of 4.5 based on a 5.0 scale. Of the three practical factors (mentioned above) where the graduates did not identify proficiency/training adequacy of 4.5 or higher, the mean was calculated at 4.0 based on a 5.0 scale. These calculated mean scores for each practical factor indicated that each graduate of the Work Control course achieved a high amount of proficiency/training adequacy. The researcher concludes that the practical factor training provided in the Work Control course is effective and should be repeated in the Navy-wide Work Control Refresher course.

3. Will the learning objectives of the Work Control course need to be re-addressed for the Navy-wide Work Control Refresher course? The learning objectives of the Work

Control course establish the foundation for the curriculum taught. These learning objectives are created based upon NAVSEA and local shipyard instruction as they pertain to the duties and responsibilities of Work Control Representatives. With the exception of Learning Objective 6 (Work Authorization Form Processes), Learning Objective 8 (Process to Release Work), and Learning Objective 15 (Placing Work on Hold), the graduates identified proficiency/training adequacy at a mean of 4.5 based on a 5.0 scale. Of the three learning objectives (mentioned above) where the graduates did not identify proficiency/training adequacy of 4.5 or higher, the mean was calculated at 4.0 based on a 5.0 scale. These calculated mean scores for each learning objective indicated that each graduate of the Work Control course achieved a high amount of proficiency/training adequacy. The researcher concludes that none of the learning objectives in the Work Control course need to be readdressed in the Navy-wide Work Control Refresher course.

4. Will the final exam of the Work Control course need to be re-addressed for the Navy-wide Work Control Refresher course? The final examination of the Work Control course is a measure of the graduates' ability to successfully retain the learning objectives and practical factors presented throughout the class. The successful completion of the exam with a grade of 75% or higher qualifies the student as a Work Control Representative who can then go to work on a project for any Work Control Group within the shipyard. The calculated mean for the final examination reflected a proficiency and training adequacy of 4.5 based on a 5.0 scale. This calculated mean score for the final examination indicated that each graduate of the Work Control course achieved a high amount of proficiency/training adequacy. The researcher concludes that the final

examination of the Work Control course does not need to be readdressed in the Navy-wide Work Control Refresher course.

RECOMMENDATIONS

The findings and conclusions of this study support the following recommendations regarding Navy-wide Work Control Refresher course training:

1. The U.S. Navy should develop a standardized Work Control Refresher course that includes curriculum, which will enable students to meet learning objectives of the resident Work Control course.

2. The U.S. Navy should develop a standardized Work Control Refresher course that includes practical factors, which will enable students to meet the hands-on objectives of the resident Work Control course.

3. The U.S. Navy should develop a standardized Work Control Refresher course that includes an examination databank based on the resident Work Control course final examination.

4. The Work Control Refresher course should be interactive between the instructor and the student. It should also be consist with other Navy-wide shipyard training in accordance with NAVSEA and local instruction.

5. The Work Control Refresher course learning objectives should be provided via Computer Based Training (CBT) to allow for off station personnel the opportunity to view the written curriculum for preview/review. This CBT should be developed using an off-the-shelf commercial authoring system.

6. All NAVSEA and local instructions referenced in the Work Control course should be made available online via a secure shipyard network. This instruction database will allow Work Control Representatives employed within a Work Control Group project the opportunity to view all directives as they pertain to the duties and responsibilities of Work Control.

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APPENDICES

APPENDIX A – Sample PSNS Work Control Course Survey for Learning Objectives

APPENDIX B – Sample PSNS Work Control Course Survey for Practical Factors and
Final Examination

APPENDIX C – Sample Cover Letter for Survey

APPENDIX D – Sample Follow on Letter for Survey

APPENDIX A

Sample PSNS Work Control Course Survey for Learning Objectives

Puget Sound Naval Shipyard Work Control Course Survey

Please take a few minutes to answer the following questions related to your recent experience with the PSNS Work Control Course. Do not include your name, badge number or work location anywhere on this survey. Your anonymity is important to obtain unbiased data. Thank you in advance for taking the time to be a part of this survey.

Learning Objectives

Select one answer for each of the following questions that best describes your response to how well each of the learning objectives was met.

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
1. I gained a basic understanding of takedown strategies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I gained a basic understanding of mapping board functions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I gained a basic understanding of Work Authorization Form preparation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I gained a basic understanding of tag-out proposal preparation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I gained a basic understanding of C/246 tag-out review procedures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I gained a basic understanding of the Work Authorization Form process.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I gained a basic understanding of linking TWDs to WAFs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I gained a basic understanding of the process to release work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I gained a basic understanding of the process to close work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I gained a basic understanding of closing tag-outs and WAFs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I gained a basic understanding of modifying WAFs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I gained a basic understanding of setting ship's system conditions (3Ds).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I gained a basic understanding of shifting isolation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I gained a basic understanding of work control responsibilities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I gained a basic understanding of placing work on HOLD.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I gained a basic understanding of posted tag check procedures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

APPENDIX B

Sample PSNS Work Control Course Survey for Practical Factors and Final Examination

Practical Factors

Select one answer for each of the following questions that best describes your response to how well each of the practical factor objectives was met.

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
17. I gained basic skills to properly prepare a Component WAF.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I gained basic skills to properly prepare a System Transfer WAF.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. I gained basic skills to properly prepare an isolation proposal for a Component WAF.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. I gained basic skills to properly perform Posted Tag Checker duties.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. I gained basic skills to properly open a Component WAF.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. I gained basic skills to properly authorize and map work associated with a System Transfer WAF.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. I gained basic skills to properly place work on HOLD associated with a System Transfer WAF.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. I gained basic skills to properly revise isolation associated with a Component WAF.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. I gained basic skills to properly close out completed work associated with a Component WAF.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. I gained basic skills to properly clear isolation associated with a Component WAF.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. I gained basic skills to properly close a Component WAF.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Final Examination

Select one answer for the following question that best describes your response to how well the Final Examination measured your overall knowledge of the course content.

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
28. The final examination adequately measured my overall knowledge of the Work Control Course content.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thank you for taking the time to fill out this survey. Your input will help us in the development of future Work Control Courses at PSNS and navy-wide shipyard facilities around the world.

APPENDIX C

Sample Cover Letter for Survey

From: PSNS Code 241.1 Technical Training
To: PSNS Work Control Course Graduates

Subj: WORK CONTROL COURSE EXTERNAL EVALUATION

1. This survey is to help determine the effectiveness of the Work Control Course at the Puget Sound Naval Shipyard for possible inclusion at additional U.S. Navy shipyards. Your responses will enable us to identify what portion(s) of the Work Control Course should be included in the navy-wide course. In addition, your responses will help determine if changes to the current Work Control Course are necessary for enhancing future training. Your feedback is critical. The results of this evaluation can directly affect the skills and knowledge taught to upcoming students of Work Control Courses offered at U.S. naval shipyards in 2004 and beyond.
2. Enclosed is a copy of the Work Control Course External Evaluation.
3. Please complete the survey questionnaire with 5 working days. Return the questionnaires in the envelope provided. Every effort has been made to ensure your anonymity. Do NOT place your name or work location on the questionnaire or return envelope.
4. Thank you for your input and assistance with this survey. Your response is greatly appreciated.

Russ Shiplet
PSNS Code 241.1
Work Control Course Lead Instructor

APPENDIX D

Sample Follow on Letter for Survey

From: PSNS Code 241.1 Technical Training
To: PSNS Work Control Course Graduates

Subj: WORK CONTROL COURSE EXTERNAL EVALUATION REMINDER

1. Approximately ten days ago you were sent a Work Control Course External Evaluation. If you have failed to do so up to this point, or if for some reason you have misplaced the evaluation, would you promptly fill out the enclosed copy of the Work Control Course External Evaluation and return it to me via the envelope provided.
2. Enclosed is a copy of the Work Control Course External Evaluation.
3. Please complete the survey questionnaire immediately. Do NOT place your name or work location on the questionnaire or return envelope. Every effort has been made to ensure your anonymity.
4. Thank you for your input and assistance with this survey. Your quick response is greatly appreciated.

Russ Shiplet
PSNS Code 241.1
Work Control Course Lead Instructor