NOSC TD 1258

NOSC TD 1258

NAVAL OCEAN SYSTEMS CENTER San Diego, California 92152-5000

Technical Document 1258
April 1988

Corrosion-Control (CC) Program: SIMA San Francisco

P. Schlunt
S. Kullerd
A. Robinson
M. Fogata

Integrated Systems Analysts, Inc.

NAVAL OCEAN SYSTEMS CENTER

San Diego, California 92152-5000

E. G. SCHWEIZER, CAPT, USN
Commander

R. M. HILLYER
Technical Director

ADMINISTRATIVE INFORMATION

This work was performed by Integrated Systems Analysts, Inc., for the Naval Surface Force, Pacific Fleet. J. Jennings, Code 932, was the contracting officer's technical representative for the Naval Ocean Systems Center.

Released by
R.K. Fogg, Jr., Head
Structural Materials
Science Branch

Under authority of
C.L. Ward, Jr., Head
Design and Development
Division

JG

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) ISA (WC)-ITR-119	5. MONITORING ORGANIZATION REPORT NUMBER(S) NOSC TD 1258
6a. NAME OF PERFORMING ORGANIZATION Integrated Systems Analysts, Inc. — 6b. OFFICE SYMBOL (if applicable)	7a. NAME OF MONITORING ORGANIZATION Naval Ocean Systems Center
6c. ADDRESS (City, State and ZIP Code) 740 Bay Boulevard Chula Vista, CA 92010	7b. ADDRESS (City, State and ZIP Code) San Diego, CA 92152-5000
8a. NAME OF FUNDING/SPONSORING ORGANIZATION Naval Surface Force Pacific Fleet — 8b. OFFICE SYMBOL (if applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER N66001-86-D-0086, DO 0008
8c. ADDRESS (City, State and ZIP Code) San Diego, CA 92136-5081	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO.: OMN — PROJECT NO.: NSURFAAC — TASK NO.: ET66 — AGENCY ACCESSION NO.: DN305 090

11. TITLE (Include Security Classification)
CORROSION-CONTROL (CC) PROGRAM: SIMA San Francisco

12. PERSONAL AUTHOR(S)
F. Schlunt, S. Kullerd, A. Robinson and M. Fogarty

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Interim	FROM TO	April 1988	140

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Wire-sprayed aluminum Powder coating Shore Intermediate Maintenance Activity

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

The current status of the SIMA San Francisco Corrosion-Control (CC) Shop is reported, with recommendations regarding industrial plant equipment, shop layout, manning, consumables, training requirements, and CC work package implementation and documentation. Specific recommendations are made regarding metallizing systems, electrostatic powder-spray systems, powder-spray booth, curing oven, vapor degreaser, caustic dip tank, and quality-assurance equipment. A preliminary list of consumables recommended for the CC shop as well as process instructions for wire-sprayed aluminum and powder coatings are provided.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION	
☐ UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT ☐ DTIC USERS	UNCLASSIFIED	
22a. NAME OF RESPONSIBLE PERSON T. Jennings, CCTR	22b. TELEPHONE (Include Area Code) (619) 553-3227	22c. OFFICE SYMBOL Code 932

DD FORM 1473, 84 JAN — 83 APR EDITION MAY BE USED UNTIL EXHAUSTED. ALL OTHER EDITIONS ARE OBSOLETE.

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE

EXECUTIVE SUMMARY

In the course of Integrated Systems Analysts, Inc.'s (ISA's), support for the Corrosion-Control (CC) Program under the direction of Commander, Naval Surface Force, U.S. Pacific Fleet (COMNAVSURFPAC), Code N4I, this interim technical information report is provided to discuss the current status of the work in progress for Shore Intermediate Maintenance Activity, San Francisco (SIMA(SF)), with respect to Delivery Order No. 0008. The scope of this Delivery Order included the following:

- Provide engineering support for Industrial Plant Equipment (IPE) review for CC production shop at SIMA(SF) and make recommendations for improvements.

- Provide engineering, technical support and training for production CC shop facilities at SIMA(SF) in accordance with plans established during the development and operation of the SIMA San Diego (SIMA(SD)) Pilot CC Shop.

- Provide technical support to analyze and evaluate the CC Training Program developed for the production CC Shop Program and analyze and evaluate CC Technician certification processes.

- Provide engineering and technical support at SIMA(SF) to establish and operate a production CC shop to ensure that the development and operation complies with plans established during the development and operation of the SIMA(SD) Pilot CC Shop.

- Provide continuing engineering and technical support to the SIMA(SF) CC Shop to evaluate ship-to-shop work-package implementation, shop production efficiencies and work complete documentation.

The SIMA(SF) CC Shop is scheduled for beneficial occupancy by the middle of Fiscal Year 1989. The SIMA(SF) facility that will house the CC Shop is currently under construction, with the initial piles having been driven.

The work performed under this Delivery Order during the period of 22 April 1987 through 30 September 1987 is summarized in the following paragraphs.

- **Industrial Plant Equipment Review** - Recommendations for IPE design have been provided based upon ISA's experience at the established CC Shops. This report cites particular equipment that should be modified or added to the present equipment lists given in the Military Construction (MCON) P-606 Development Plan. The equipment that is discussed include: metallizing systems, powder-spray booth, curing oven, electrostatic powder-spray systems, vapor degreaser, caustic dip tank and quality assurance equipment.

- **Training Support** - Since the SIMA(SF) CC Shop is scheduled for beneficial occupancy in Fiscal Year 1989, training has not been conducted to date. Currently, two training courses have been developed and will be validated at SIMA(PH) in Fiscal Year 1988. These courses and materials must be provided for SIMA(SF) CC Shop personnel and Ship's Force personnel as discussed herein.

- **Engineering and Technical Support for CC Shop Establishment** - A preliminary list of CC Shop consumables was developed and is provided. ISA will perform further analysis during the year prior to CC Shop operation in order to review and revise this list based upon refined production requirements and changes in local sources and standard Navy stock system supplies.

  Preliminary process instructions for wire-sprayed aluminum and powder coating were developed and are also provided. ISA will review and revise these process instructions accordingly to ensure compliance with NAVSEA policy at the time of shop initial operation.

- **Work Package Implementation and Documentation** - A Ship Class Master Job Catalog for CC work is currently being developed and evaluated as a method of CC Work Package definition and implementation. CC Work Package Guides are being developed for ships homeported at San Diego and Pearl Harbor which define CC work package candidate work and procedures to implement and document CC work. ISA will prepare CC Work Package Guides for all ships to be homeported at San Francisco as they are designated.

This report contains recommendations for: IPE, IPE PMS, shop manning, training requirements, consumables, process instructions and CC Shop Work Package Implementation and Documentation. The recommended CC Shop consumables are listed in Appendix A. Draft process instructions for the application of wire-sprayed aluminum and powder coatings are provided in Appendices B and C, respectively.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 GENERAL

The Commander, Naval Surface Force, U.S. Pacific Fleet (COMNAVSURFPAC) has a continuing program to reduce nonproductive Ship's Force (S/F) labor and redirecting S/F labor to readiness training and to enhanced equipment/system maintenance. Shipboard corrosion has historically been a major source of repetitive maintenance, repetitive in the sense that the paint and preservations have a short service life which results in frequent reapplication and topcoating.

1.1 BACKGROUND

In 1983, a Senior Navy Steering Board proposed that Type Commanders and their Shore Intermediate Maintenance Activities (SIMAs) identify requirements and develop the capability to deliver a full spectrum of corrosion-control (CC) services. The objective of the SIMA CC Shops would be to:

- Reduce the excessive S/F manhours spent on corrosion prevention and control.
- Extend the service life of shipboard components, spaces and structures by reducing marine corrosion.
- Reduce or eliminate material, labor and schedule costs involved in the repair or replacement due to corrosion.

The majority of SIMAs currently do not have the manning, equipment, industrial processes or Shop organization to provide all of the CC services as defined by Naval Sea Systems Command (NAVSEA), however, some SIMAs do have a capability to provide limited CC work that meets the operational and technical requirements of COMNAVSURFPAC and/or NAVSEA.

Accordingly, COMNAVSURFPAC initiated a program to procure, install, train and operate production CC Shops at the COMNAVSURFPAC SIMAs. To date, CC Shops have been established at SIMA Pearl Harbor (PH) and SIMA San Diego (SD), and will be established at SIMAs Long Beach (LB), San Francisco (SF) and Puget Sound (PS).

1.2 SCOPE OF WORK

This report shall summarize the progress and support provided and provide recommendations. The technical support as stated within the Delivery Order was to include the following:

- Provide engineering support for Industrial Plant Equipment (IPE) review for CC production Shop at SIMA(SF) and make recommendations for improvements.
- Provide engineering, technical support and training for production CC Shop facilities at SIMA(SF) in accordance with plans established during the development and operation of the SIMA(SD) Pilot CC Shop.

- Provide technical support to analyze and evaluate the CC Training Program developed for the production CC Shop program and analyze and evaluate CC technician certification processes.

- Provide engineering and technical support at SIMA(SF) to establish and operate a production CC Shop to ensure that the development and operation complies with plans established during the development and operation of the SIMA(SD) Pilot CC Shop.

- Provide continuing engineering and technical support to the SIMA(SF) CC Shop to evaluate ship-to-shop work-package implementation, shop production efficiencies and work-completed documentation.

2.0 SIMA(SF) CC SHOP

2.1 GENERAL

The San Francisco Bay area is the home of four U.S. Naval facilities where surface ships will be homeported or serviced. These facilities are Alameda Naval Air Station, Concord Naval Weapons Station, Oakland Naval Supply Depot, and SIMA(SF) at Hunter's Point. There are currently 16 surface ships stationed in the Bay area, plus two aircraft carriers. By Fiscal Year 1994, the port loading is expected to include 32 surface ships, including two aircraft carriers.

Construction began this fiscal year at Hunter's Point towards the installation of a new SIMA facility under Military Construction (MCON) Project P-606. This new facility will house the only full-production SIMA CC Shop in the entire Bay area. Beneficial occupancy is scheduled by the middle of Fiscal Year 1989. Limited CC services are currently available for steam valves at the Valve Repair Barge of SIMA(SF) at Hunter's Point (reported on earlier in Ref. (a)). Currently, the construction of the entire SIMA facility, including the CC Shop, is in the initial stages. To date, the site has been cleared and piles have been driven.

The CC Shop at SIMA(SF) will consist of 3,684 square feet of enclosed floor space on the east end of the new SIMA building constructed under MCON P-606. The Shop is currently planned to contain areas for:

- Receiving
- Degreasing
- Sandblasting
- Wire-Spray Aluminum (WSA) Application
- Paint Spraying

The most recent MCON P-606 Development Plan, dated 3 April 1987 (Ref. (b)), does not explicitly mention a powder-coating capability, however, there are provisions for a dry-filter powder-spray booth and an oven. The inadequacies of the listed spray booth and oven will be described later.

The CC Shop is to provide ship-to-shop and shop-to-shop CC services. Primarily these services will consist of WSA (for high- and low-temperature applications), paint (for topcoating WSA), powder coatings and improved fasteners in the form of installation kits. The Shop shall also provide technical assistance for all of the designated 15 NAVSEA CC Systems.

2.2 CC-SHOP LAYOUT

The CC-Shop layout, based on the 100%-design drawings, is presented in Figure 2-1. Several recommendations are made later in this report regarding a change in the curing oven and the addition of a caustic dip tank. In addition, the arrangement of the oven and spray booth for powder coating should be expanded. Powder-coated components should have a direct route between oven and spray booth to minimize any cooling of the components during product transfers that occur during the process. A recommended CC-Shop layout incorporating these changes in equipment and arrangement is given in Figure 2-2.

2.3 UTILITIES

The Shop space will be provided with the necessary utilities for proper and safe equipment operation. Convenience duplex receptacles rated at 120V will be available throughout the area. In addition, disconnect boxes will be provided for 120V, 1-phase, 60Hz; 208V, 3-phase, 60Hz; and 480V, 3-phase, 60Hz electrical power. The recommended CC-Shop Industrial Plant Equipment (IPE) will require approximately 600A at 480V. Illumination is to be provided at an average level of 70 footcandles. Heating and ventilation and fume exhaust systems for the oven, paint spray booth, metal-spray booth, blast cabinets and vapor degreaser will be provided. Dry, oil-free, filtered air is to be supplied at 120 psig to the paint spray booth, metal-spray equipment, blast cabinets and vapor degreaser. Plumbing connections and sanitary drain connections will be required for the paint and metal-spray booths and emergency shower or eyewash stations.

2.4 EQUIPMENT

Equipment being procured under the MCON P-606 consists of both IPE and minor expense equipment. The MCON-funded equipment is not enough to permit the CC Shop to operate. Several types of additional IPE and minor expense items will need to be procured. Some of these items require modifications and are discussed in the subsections that follow.

2.4.1 Industrial Plant Equipment (IPE)

IPE which is being procured through the MCON funding consists of five generic items:

- Jib Crane, floor-mounted, one ton
- Blast Cabinets, walk-in (quantity of two)
- Booth, dry-filter, powder-spray

(Text continues on page 6)

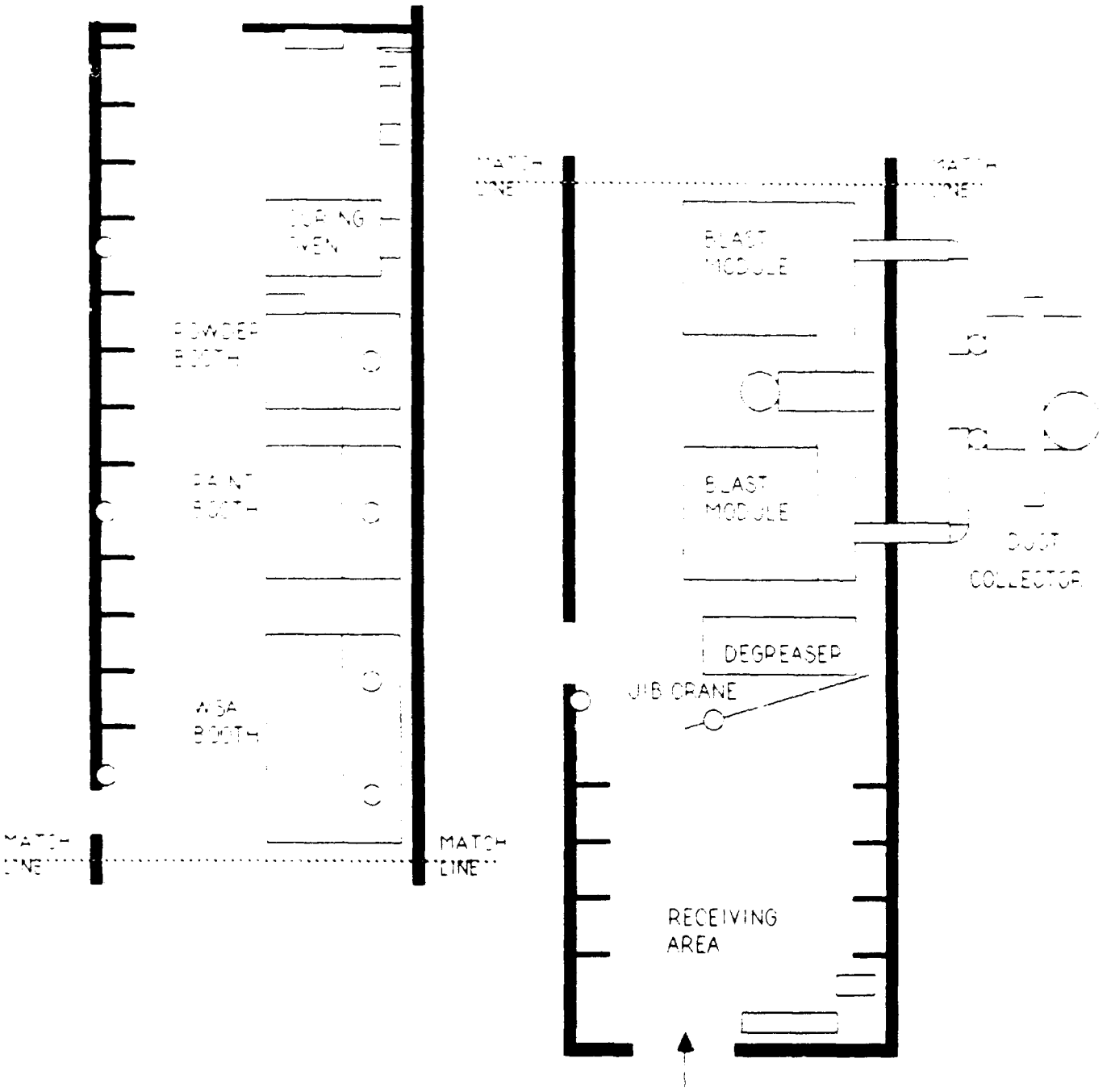


Figure 2-1 **SIMA(SF) CC Shop Layout (Current)**

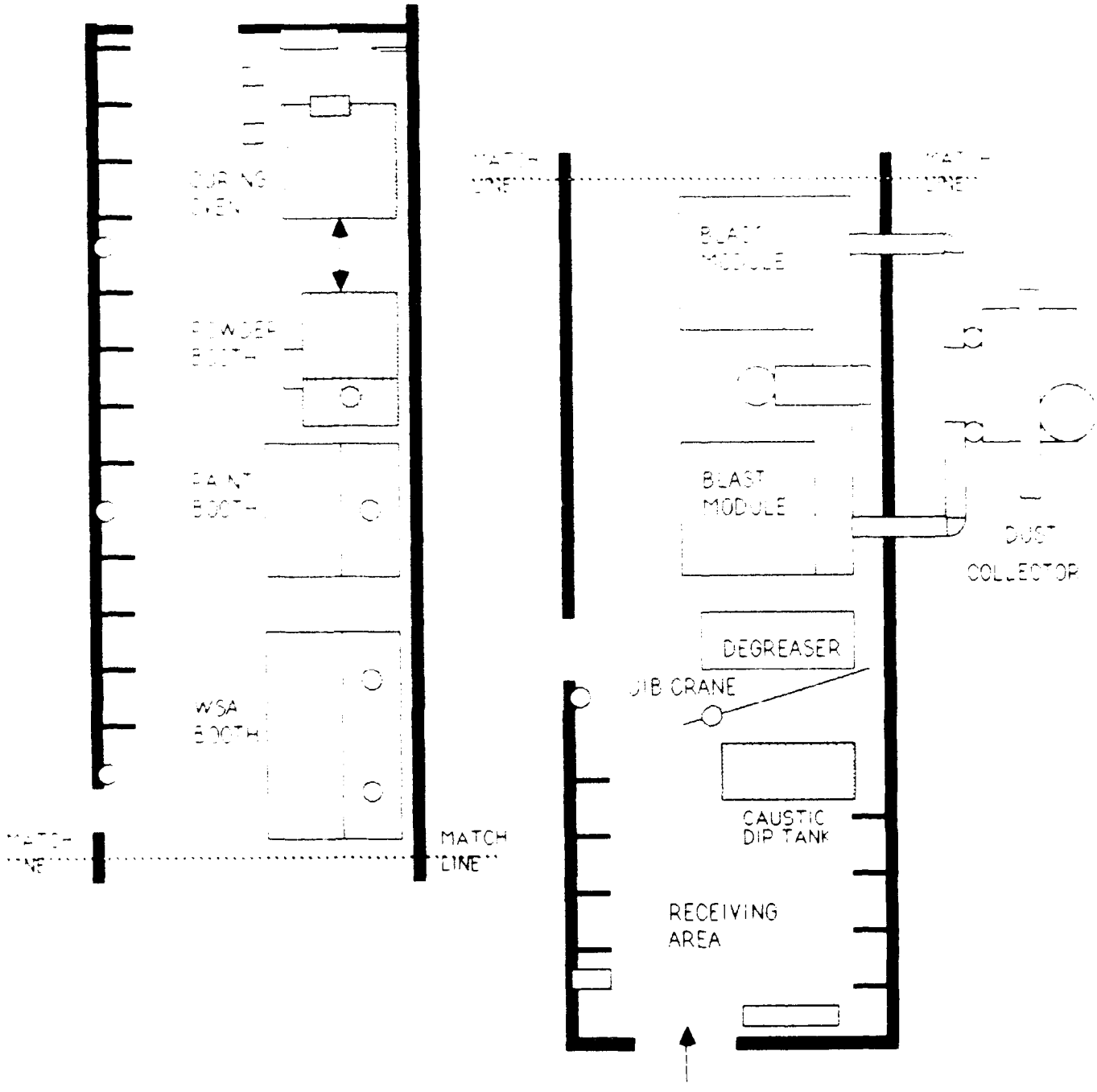


Figure 2-2 **SIMA(SF) CC Shop Layout (Recommended)**

- o Booth, waterwash, metal-spray
- o Booth, paint-spray

2.4.1.1 Metallizing Systems

The list of MCON-funded IPE could be improved by including a minimum of two flame-spray metallizing systems (flame-spray guns, wire-feed reels, gas-control manifolds and accessories). It is unclear whether the two systems currently in use at the Valve Barge will be transferred to the SIMA(SF) CC Shop, or if the Valve Barge will remain a separate maintenance entity. In any case, the CC Shop will require the presence of at least two metallizing systems in order to apply wire-sprayed aluminum (one system in service with the other as back-up).

2.4.1.2 Powder-Spray Booth

The current powder-spray booth procurement specification does not incorporate any of the lessons learned during the Pilot Powder Coating Station Service Test (Ref. (c)) conducted between July 1985-February 1986. The present specification calls for a basic dry-filter spray booth. This type of booth slowly becomes clogged with over-spray between filter replacements and requires extreme attention from the operators in assuring the filter cells are replaced at the proper time. There is no definite time schedule for replacing filter cells because it is dependent upon use. The only indication for filter replacement is to regularly measure the booth air velocity or have an air plenum-pressure gage which is connected to an alarm to signal inadequate flow. The common dry-filter paint arrestor booths will keep exhaust air grain-loading levels below the ceiling limits, but can permit enough powder to be expelled to be a nuisance which is a violation of most air pollution laws.

It is strongly recommended that the Navy install the same type of booth utilized in the SIMA(SD) Pilot Powder Coating Station Service Test. This booth had a set of cyclicly-cleaned primary filter cartridges and a set of final absolute filters. The dry-filter cartridge booth with cyclic air backflushing performed with no pollution, safety or maintenance problems. Booths can be designed with either timed purges or plenum-pressure signaled purges. The final absolute filters remove enough powder from the final exhaust air that the booth may be exhausted into the workspace. This saves in ductwork, building heating costs and nuisance pollution problems. A letter recommending the installation of this type of booth at SIMA CC Shops was forwarded to NAVSEA 93F23 in August of 1987 (Ref. (d)).

2.4.1.3 Degreaser, Curing Oven and Caustic Dip Tank

Two pieces of IPE that are shown in the SIMA(SF) design drawings (Ref. (e)) and Development Plan (Ref. (b)) are not funded under the MCON P-606 contract and must be funded under another procurement by NAVSEA 93F. These items are:

- o Degreaser, vapor
- o Oven, drying

Based on experience from SIMA(SD) and SIMA(PH), it is anticipated that the cooling water system of the degreaser will be a problem. The vapor degreaser provided to SIMA(SD) under the Naval Regional Contracting Center (NRCC) Washington Solicitation No. N66156-86-C-65084 is designed with an open cooling-water system. The cooling water is utilized to remove heat from the condenser for the degreaser. The cooling water requirement is 7-11 gpm. The cooling-water outlet temperature is between 95°F and 120°F. This same type of degreaser will probably be provided to SIMA(SF). References (f), (g) and (h) prohibit open cooling-water systems on equipment at shore-based activities. Converting the open cooling system to a closed cooling system would involve the installation of a cooling unit that will cool the water to 60°F and return the water to the vapor degreaser. A recommended cooling unit is an air-cooled condenser refrigerant-type water chiller of 20-ton coolant capacity. This information was provided to NAVSEA 93F through References (i) and (j). The chiller would cost approximately $18,000.

The oven specified (Grieve Corporation, Model 333) will not be of any significant benefit to the Shop. Its interior dimensions, 36"x36"x36", are too small for many ship components. The fact that it is listed as a drying oven indicates that it was sought for paint drying and not for curing powder. Powder coating shows much promise in being a replacement for painting on components which can be removed from a ship (Ref. (c)). There is not enough shop floor space for both ovens. Even though the floor space for paint drying is limited, the small drying oven should be deleted. Typical components which receive WSA and paint could not fit in the three-cubic-foot interior, such as watertight doors and portable stanchions.

It is strongly recommended that a larger oven be procured and installed at SIMA(SF). The oven that has been recently installed at SIMA(PH) is of correct interior dimensions (7'H x 8'W x 12'D). This oven is large enough for common powder-coated components such as fog applicators and stowage lockers. It is a special walk-in oven manufactured by the Grieve Corporation for the U.S. Government, purchased under Contract N00600-86-C-1519. This is the type of oven required for the SIMA(SF) CC Shop. A fume-exhaust system will not be required for powder coating, but will be necessary if the oven is to be used for degreasing porous castings. The improperly specified oven costs approximately $2,220. The correct oven will cost approximately $99,000.

An item that is not currently included for installation in the SIMA(SF) CC Shop is a caustic dip tank. This piece of IPE would play a crucial role in improving Shop throughput when processing ship components that have partially degraded zinc or aluminum coatings. Old, deteriorated aluminum or zinc coatings, applied by thermal spray or hot dip, are difficult to remove by abrasive blasting. Caustic solutions are extremely efficient at removing these damaged coatings. If no caustic dip tank in the SIMA facility has a schedule permitting use by the CC Shop, then a tank should be procured. An agitated tank similar to RAMCO Model CM72 (69"x36"x27" workspace) could handle four watertight doors simultaneously. This tank would cost approximately $18,000.

2.4.2 Minor Expense Equipment

Numerous small pieces of equipment are currently listed as minor expense items. These can be grouped in the categories of:

- Cleaning Gun, solvent-type
- Fire Extinguishers, Halon-type
- Paint Spray Hoods, canvas
- Workbenches
- Cabinets
- Shelving
- Drum Cradles
- Pallet Racks
- Paint Mixer
- Paint Spray Guns, air-pressure type
- Paint Spray Guns, airless
- Air Purifiers
- Spray Gun Accessories
- Turntable
- Stool
- Hydraulic Cranes
- Eyewash Station, emergency

The emergency eyewash stations are funded under MCON P-606 and are being installed throughout the SIMA(SF) facility. All other minor expense equipment will be provided through another procurement by NAVSEA 93F.

Items which are noticeably absent from the list are electrostatic powder-spray systems and quality-assurance equipment.

2.4.2.1 Electrostatic Powder-Spray System

The Nordson D-1 and the Randsburg-Gema, Type 701, are good powder application systems and should be procured for the SIMA(SF) CC Shop. The Nordson system proved its advantages for large surfaces and the

Gema system had advantages for more complex geometries (Ref. (e)). At a minimum, two systems should be procured. Two of the same systems may be beneficial for maintenance reasons, however both systems were found to be extremely durable and required very little maintenance. Two different systems could better handle the wide range of components and therefore it is recommended that one Nordson D-1 and one Randsburg-Gema Type 701 system be procured for the SIMA(SF) CC Shop. Although unlikely, sufficient spare parts for each should be maintained to avoid any possible downtime due to breakdown.

2.4.2.2 Quality-Assurance Equipment

Proper quality control of the WSA, painting and powder-coating processes require the use of quality-assurance (QA) equipment. This equipment should include:

- Two Dial Micrometers (Fowler MT-52-550-005)
- Ten Wet Film Thickness Gages (GARDCO 10-80 mils)
- Two Magnetic Dry Film Thickness Gage (Mikrotest FM)
- Two Eddy-Current Dry Film Thickness Gage (NORDSON DFG-E2)
- One Sling Psychrometer (Taylor 1330-P)
- One Impact Tester (GARDCO 5510)
- Two Pull-off Magnetic Dry Film Gages (Elcometer 157)
- One Adhesion Tester (Elcometer 106/4)
- One U.S. Standard Testing Sieve, 16-mesh (McMaster-Carr 328K13)

2.4.3 Permit Requirements

The vapor degreaser, caustic dip tank, abrasive blast modules, flame-spray booth, paint-spray booth, powder-spray booth and curing oven will require permits to operate from the local air pollution control authority and possibly the Regional Department of Health. Assistance has been provided to the Bay Area Air Quality Management District in the form of paint usage rates, coating types and volatile content. Upon IPE manufacturer designation, ISA will assist with the application for permits as required through the Western Division Naval Facilities Engineering Command.

2.5 IPE PLANNED MAINTENANCE SYSTEM (PMS)

The establishment of a CC Shop at a SIMA requires the installation of IPE unique to the application of CC coatings. The uniqueness of this IPE to a CC Shop presents a maintenance problem to SIMA personnel in that the equipment is new and unfamiliar to the maintenance personnel. In order to reduce unnecessary equipment downtime directly related to poor preventive maintenance and improper equipment operation, a CC-Shop PMS and Equipment Operating and Sequencing System (EOSS) should be developed for the equipment being installed at SIMA(SF).

It is recommended that the development of CC Shop PMS begin as soon as the IPE procurements are finalized and manufacturer's technical information becomes available. ISA is currently developing the PMS and EOSS for SIMA(PH) and will utilize the validated SIMA(PH) systems as guidelines to develop the SIMA(SF) PMS and EOSS.

2.6 CC-SHOP CONSUMABLES

The CC Shop will require the purchase of numerous consumables, including masking materials, abrasive grit, metal-spraying materials, paints and thinners, clothing and safety equipment, powder coatings and fasteners. Appendix A includes a preliminary list of the consumables required with recommended initial stock quantities, consumption rates, and national stock numbers or possible open-purchase sources. The required consumables for the SIMA(SF) CC Shop were determined utilizing projected port loading and data from the SIMA(SD) Pilot CC Shop Service Test (Ref. (m)). When purchasing items not available in the Navy Supply System, the Supply Department for SIMA(SF) is encouraged to check area blanket purchase agreements (BPA) and qualified product lists (QPLs) from NAVSEA.

Sample DD1149 Forms are contained within Appendix A to illustrate the correct manner to order fasteners which are not in the Navy Supply System. These fasteners are made of 316 stainless steel (SS) or ceramically-coated (MIL-C-81769) SAE Grade 2 carbon steel fasteners. Sample procurement specifications for purchasing powder coatings and abrasive grit, utilized by SIMA(PH), are also provided. These procurement specifications will be forwarded to NAVSEA 05M1 for review and approval.

2.7 MANNING

Based on the SIMA(SD) Pilot CC Shop Service Test (Ref. (m)), projected port loading, recommended IPE and current CC availability policies, the recommended CC Shop manning for the SIMA(SF) CC Shop is given in Table 2-1.

Table 2-1 Recommended SIMA(SF) CC Shop Manning

FUNCTION	QUANTITY
Shop Supervisor	1
Assistant Supervisor	1
QA	1
Supply	1
WSA Production	10
Powder Coating Production	4
Installation Kit	2
Total	**20**

The ten WSA production technicians are involved with all aspects of the process including degreasing, masking, abrasive blasting, metal spraying and painting. The four powder-coating production technicians are involved with degreasing, masking, abrasive blasting and powder application. Any changes in IPE, port loading or availability policies will require reevaluation of the manning requirements.

2.8 TRAINING

2.8.1 CC Shop Technician Training Course

The CC-Shop Technician Training Course Instructor Guide was developed by ISA and reviewed by NAVSEA, as reported by Reference m. This course was needed for CC Shop personnel because of their inexperience in the aspects of marine corrosion, NAVSEA's approved CC methods and processes and the equipment associated with the application of these CC systems. The objective of this training program was to enable CC Shop personnel to apply the CC coatings, to provide CC technical assistance to other SIMA Shops and tended ships and to become certified in accordance with the standards governing the CC system application. In addition to the Instructor Guide of the CC-Shop Technician Training Course, COMNAVSURFPAC N4I recognized the requirement that a Student Workbook is required. The Student Workbook will provide the student with a place to take notes and serve as a ready reference for use after the course is completed. This Student Workbook has been developed as reported by Reference 3f and has been incorporated into the CC Shop Technician Training Course.

The initial CC Shop personnel to receive the CC-Shop Technician Training Course shall be the SIMA(PH) Technicians in October 1987. The validation of the CC Shop Technician Training Course shall occur during this training and all changes to the course developed during the SIMA(PH) training shall be incorporated and published by March 1988. It is recommended that the validated CC-Shop Technician Training Course be conducted prior to CC-Shop operation once the IPE is installed.

COMNAVSURFPAC N4I recognized the requirement that a Student Workbook is required in addition to the Instructor Guide of the CC-Shop Technician Training. The Student Workbook will provide the student with a place to take notes and serve as a ready reference for use during and after the course is completed. The Student Handbook has been developed and has reported by Reference (p). The validation of the Student Workbook shall occur during the training of the SIMA(PH) Shop Technicians scheduled for October 1987.

2.8.2 CC Shipboard Training Course

In addition, COMNAVSURFPAC N4I recognized the importance of training S/F personnel in the use of CC systems, repair of the CC coatings and proper installation of the coated equipments onboard the ship. The validation of the shipboard training program shall occur during the first quarter of Fiscal Year 1988 onboard ships homeported in Pearl Harbor and San Diego. The validated Shipboard Training Course shall be published by March 1988.

2.9 PROCESS INSTRUCTIONS

2.9.1 Draft WSA Process Instruction

As required by paragraph 5.3.1 of Reference (q), a Naval activity must submit a written procedure to be utilized in the application of WSA at that activity for approval prior to WSA application. Appendix B contains the Draft Process Instruction recommended to be utilized by SIMA(SF) for WSA application. Appendix B has been developed utilizing Reference (d) for the equipment to be installed at SIMA(SF). It is recommended that Appendix B be forwarded to NAVSEA 05M for approval prior to WSA production. When DoD-STD-2138 is revised, ISA will coordinate with NAVSEA 05M1 to develop a revised process instruction for WSA application at SIMA(SF).

2.9.2 Draft Powder Coating Process Instruction

Although no U.S. Navy or DoD Standard exists for the application of powder coatings on shipboard components, a draft Powder-Coating Process Instruction has been developed for the SIMA(SF) CC facility. Appendix C contains the recommended Draft Process Instruction for powder coating application at SIMA(SF) developed by ISA. It is recommended that Appendix C be utilized as the governing document for the application of powder coatings at SIMA(SF) until further guidance is promulgated by NAVSEA 05M. It is recommended that ISA coordinate with NAVSEA 05M1 to develop a DoD standard for the application of powder coatings and revise this process instruction accordingly.

2.10 CC WORK PACKAGE IMPLEMENTATION AND DOCUMENTATION

ISA is currently developing and analyzing the use of Ship Class Master Job Catalogs (MJCs) for CC Work Package implementation. CC work is suitable for a MJC in that (1) equipments are common to ships of a class; (2) most equipments have quantities exceeding 50; (3) each equipment receives the same recommendation regarding CC coating and installation kit.

A draft CC MJC has been developed for the AO 177 Ship Class. This MJC will be utilized by the USS WILLAMETTE (AO 178) in January 1988, and closely monitored by ISA. Based upon the success of the AO 177 Class MJC, MJCs will be recommended to be developed for all other ship classes, and should these MJCs come into realization, it is recommended that they be utilized at SIMA(PS) for CC Work Package implementation.

ISA has also been assisting CC availability planning by developing CC Work Package Guides for Pacific Fleet ships. Each Work Package Guide discusses the background of the CC program, explains the CC availability procedures, provides Installation Kit Technical Data Sheets, contains a detailed list of all topside shipboard components recommended for CC services and provides a method of documenting CC work completed. Work Package Guides have been developed for ships serviced in SIMA(SD) and SIMA(PH). It is recommended that Work Package Guides be developed for ships to be serviced at SIMA(PS) prior to entering into CC availabilities for CC Work Package planning and documentation.

3.0 SIMA(SF) CC SHOP RECOMMENDATIONS

The recommendations for improving the development of a full-production CC Shop at SIMA(SF) are summarized here.

3.1 CC SHOP LAYOUT

The recommended CC Shop layout presented in Figure 2-2 should be considered by NAVSEA 93F for improving the production efficiency of the CC Shop. The rearrangement of powder-spray booth and curing oven will enable quicker, less inhibited flow between the two pieces of IPE.

3.2 METALLIZING SYSTEMS

The CC Shop must have a minimum of two metallizing systems (flame-spray gun, wire feeder, gas controls and accessories), one system for use with the other as backup (or receiving PMS). METCO 10E or 12E, or MOGAL TJ-5 are applicable systems.

3.3 POWDER-SPRAY BOOTH

A cartridge-type spray booth with cyclic backflushing and high efficiency final filters should be procured by NAVSEA 93F and installed at the CC Shop. This booth will provide safe, low maintenance, pollution-free service more so than the currently specified booth.

3.4 POWDER-CURING OVEN

The 36"x36"x36" drying oven currently specified should be replaced by a 7'Hx8'Wx12'D powder curing oven. Even though paint drying space is limited in the SIMA(SF) Shop, the paint drying oven should be deleted. The 36"x36"x36" interior would not be able to handle even common components, such as watertight doors or portable stanchions. The larger interior dimensions will be required to process the majority of shipboard components, such as fog applicators and storage lockers.

3.5 VAPOR DEGREASER CLOSED COOLING-WATER SYSTEM

Open cooling-water systems are prohibited at shore-based activities and therefore a 20-ton cooling capacity chiller should be provided with the vapor degreaser. This purchase should be coordinated by NAVSEA 93F.

3.6 CAUSTIC DIP TANK

If no other caustic dip tanks can be scheduled for use by the CC Shop, then one should be installed within the CC Shop. An agitated tank with 69"x36"x27" interior workspace would be sufficient for the type of components to be cleaned. A rinsing booth will also be required.

3.7 ELECTROSTATIC POWDER-SPRAY SYSTEMS

Electrostatic Powder-Spray Systems (gun, hopper and control console) must be procured by NAVSEA 93F for the CC Shop to provide powder-coating services. Two systems, the Nordson D-1 and Ransburg-Gema Type 701 are recommended.

3.8 QUALITY-ASSURANCE (QA) EQUIPMENT

The CC Shop must acquire several pieces of QA equipment through NAVSEA 93F in order to maintain the quality of the coatings to be applied. The shop will require surface profile testing equipment, dry film thickness gages (for magnetic and nonmagnetic substrates), wet film thickness gages, impact test meter, adhesion tester and a sling psychrometer.

3.9 IPE PMS

Upon finalization of IPE procurements and the availability of manufacturer's technical information, ISA will develop the necessary IPE PMS and EOSS for SIMA(SF).

3.10 CC-SHOP CONSUMABLES

The preliminary CC-Shop consumables lists provided in Appendix A. This consumables list will be updated by ISA after monitoring the operation of the full-production CC Shops at SIMA(SD) and SIMA(PH) prior to the start-up of the SIMA(SF) CC Shop.

3.11 TRAINING

The CC Shop Technician Training Course must be provided to CC Shop personnel prior to operation in order to comply with current policy governing the application of CC coatings. It is also recommended that the CC Shipboard Training Course be provided to S/F personnel prior to a ship receiving CC services from the SIMA(SF) CC Shop.

3.12 PROCESS INSTRUCTIONS

The SIMA(SF) CC Shop should utilize the process instructions developed by ISA (Appendices B and C) for the application of WSA and powder coatings, respectively. ISA will review and revise these documents accordingly to ensure compliance with NAVSEA guidance. SIMA(SF) should forward the revised process instructions to NAVSEA 05M1 for approval prior to shop operation.

3.13 CC WORK PACKAGE IMPLEMENTATION AND DOCUMENTATION

Based upon the success of the AO 177 CC MJC, CC portions of ship class MJCs applicable to SIMA(SF) should be developed. ISA will also develop CC Work Package Guides for all ships designated to be homeported in San Francisco prior to receiving CC services from the SIMA(SF) CC Shop.

REFERENCES

a. Kullerd, S., et.al., "Corrosion-Control Program: COMNAVSURFPAC SIMA Corrosion-Control Support," ISA(WC)-INTERIM-114, 31 March 1987, N66001-86-D-0086.

b. MCON P-606 Development Plan: SIMA San Francisco at Hunter's Point, 3 April 1987.

c. Schlunt, P., et.al., "Corrosion-Control (CC) Program: Pilot Powder Coating Station Service Test," ISA(WC)-ITR-108, 14 March 1986, N66001-85-D-0015.

d. Integrated Systems Analysts, Inc. Letter 5-7-340, dated 5 August 1987.

e. Esherick Homsey Dodge and Davis, Shore Intermediate Maintenance Activity FY1986 MCON Project P-606, 100% Submittal Drawings, 3 July 1986.

f. OPNAVINST 5090.1, dated 26 May 1983.

g. NAVFAC MO-210, dated 30 August 1984.

h. Naval Energy and Environmental Support Activity Water Management Contingency Planning Criteria, dated June 1986.

i. Integrated Systems Analysts, Inc., Letter 5-7-320, dated 23 July 1987.

j. Integrated Systems Analysts, Inc., Letter 5-7-343, dated 10 August 1987.

k. OPNAVINST 4790.4A, Maintenance and Material Management (3-M) System Manual, dated 27 August 1984.

l. MIL-P-24534A (Navy) titled "Planned Maintenance System: Development of Maintenance Requirement Cards, Maintenance Index Pages and Associate Documentation," dated 7 May 1985.

m. Adkins, W., et.al., "Corrosion-Control (CC) Program: SIMA Pilot CC Shop Service Test and Technical "Support, ISA(WC)-107, 30 November 1986, Contract N66001-85-C-0350.

n. NAVSEASYSCOM Letter 1500 CEL-MP/4006 of 1 June 1987.

o. Brucker, C., et.al., "Corrosion-Control (CC) Shop Technician Training Curriculum in the SQIP Format, Revision," 15 August 1987.

p. Corrosion-Control Program: SIMA CC Shop Instructor and Student Handbooks and Shipboard Training, ISA(WC)-120, 30 September 1987, Contract N66001-86-D-0086.

q. DoD-STD-2138(SH), "Metal-Sprayed Coating Systems for Corrosion Protection Aboard Naval Ships," 23 November 1981

APPENDIX A

SIMA(SF) CC SHOP

CONSUMABLES

A.0 SIMA(SF) CC SHOP CONSUMABLES

A.1 GENERAL CONSUMABLES LIST

Consumables necessary for the daily shop processes are listed in Table A-1. This list includes masking materials, abrasive grit, paint, safety materials, powder and door and hatch fasteners. The initial inventories, monthly consumption rate and national stock number or potential open purchase sources are provided in Table A-1.

A.2 SAMPLE REQUISITION FORMS (DD1149) FOR FASTENERS

Large quantities of CRES 316 fasteners and ceramically-coated mild steel fasteners need to be purchased for installation kits provided by the shop. None of these fasteners are currently available through the Navy Supply System. In order to assist the Supply Department, the recommended fastener quantities and types are provided in the form of sample DD1149's.

Fasteners fabricated from CRES 316 may be obtained directly from vendors, however, ceramic-coated fasteners will require a two-step procedure. First, the mild steel fasteners must be procured, and then sent to a NAVSEA-qualified coating service firm to have the ceramic coating applied.

The DD-1149's for CRES 316 fasteners are given on pages A-8 through A-30. Mild steel fasteners are covered on pages A-31 through A-42 and the required ceramic coating on pages A-43 through A-49.

A.3 SAMPLE POWDER-COATING PROCUREMENT SPECIFICATION

A sample powder-coating procurement specification is provided on pages A-51 through A-53. This document was utilized at SIMA(PH) due to no approved DoD standard in existence governing powder coatings for Naval CC applications.

SAMPLE AMENDMENT OF SOLICITATION FOR ABRASIVE GRIT (ALUMINUM OXIDE)

Aluminum oxide is required by DoD-STD-2138 (Metal-Sprayed Coatings for Corrosion Protection Aboard Naval Surface Ships) for anchor-tooth blasting. The grit must meet MIL-A-21380B. The abrasive grit standard does not state the most beneficial mesh size for the WSA or powder-coating processes, nor does it require that it be virgin abrasive. The proper forms for amending the specification are given on pages A-54 through A-56. These particular samples have been utilized in SIMA(PH).

Table A-1 SIMA (SF) CORROSION CONTROL SHOP CONSUMABLES LIST

ITEM	INITIAL STOCK	CONSUMPTION PER MONTH	NATIONAL STOCK NUMBER OR OPEN PURCHASE SOURCE
STAGE 1 - RECEIVING			
ID Tags	1000	400	NSN 0116 LF 890 9020
Electrical Ties	12 pkgs	6 pkgs	NSN 5975-00-074-2072
Dog Tags	1000	400	NSN 8465-00-242-4804
Shock Clips	1000	400	NSN 7230-00-252-3384
STAGE 2 - DEGREASING			
Respirator, Charcoal Filters	50	50	NSN 4240-01-074-8390
1,1,1 Trichloroethane	750 gals	750 gals	NSN 6810-00-531-1487
1,1,1 Trichloroethane Spray Can	50	50	NSN 6810-00-930-6311
Gloves (rubber), Chemical	2 pr	1 pr	NSN 8415-00-266-8675
Apron, Plastic	2	1	NSN 8415-00-715-0450
Rags	100 boxes	100 boxes	NSN 7920-00-205-1711
STAGE 3 - MASKING			
Duct Tape - 1/2"	50 rolls	50 rolls	NSN 8315-00-890-9872
Duct Tape - 2"	50 rolls	50 rolls	NSN 8315-00-890-5100
Aluminum Tape, High Temp.	30 rolls	30 rolls	NSN 7510-00-816-8077
Utility Scalpels	20 boxes	20 boxes	NSN 8530-00-162-5629
Plugs (various sizes)			Open Purchase: Lear Siegler, Inc Accurate Products Div 4370 Jutland Drive San Diego, CA 92117

Table A-1 SIMA (SF) CORROSION CONTROL SHOP CONSUMABLES LIST

ITEM	INITIAL STOCK	CONSUMPTION PER MONTH	NATIONAL STOCK NUMBER OR OPEN PURCHASE SOURCE
STAGE 4 STRIP BLASTING			
Garnet ·nd, # 36 mesh	60,000 lbs	60,000 lbs	Open Purchase: Barton Mines Corp P O Drawer 400 North Creek, NY 12853 Meyers Metals and Minerals, Inc 459 Coleman Bldg Seattle, WA
Face S ds (disposable)	250	250	Open Purchase: Bullard Safety Equipment P O Box 385 White Oak Pike Cythiana, KY 40031
Ear Pl ~	3 boxes	3 boxes	NSN 6515-00-137-6345
STAGE 5 ANCHOR-TOOTH BLASTING			
Alum -Oxide Grit, # 16 mesh	25,000 lbs	25,000 lbs	Open Purchase: KELCO Sales & Engineering, Co Front St & Paddison Avenue Norwalk, CA 90650 SOHIO E ctro Minerals, Co P O Box 423 Niagara Falls, NY 14302
Press m (X coarse)	20 rolls	20 rolls	Open Purchase: KTA-TATOR, Inc 115 Technolog / Drive Pittsburgh, PA 15275

Table A-1 SIMA (SF) CORROSION CONTROL SHOP CONSUMABLES LIST

ITEM	INITIAL STOCK	CONSUMPTION PER MONTH	NATIONAL STOCK NUMBER OR OPEN PURCHASE SOURCE
STAGE 5 ANCHOR-TOOTH LASTING (Continued)			
Gloves, Blasting	10 prs	10 prs	Open Purchase: Safety Equipment Co 659 Industrial Drive Tallahassee, FL 32304
Face Shields (disposable)	250	250	Open Purchase: Bullard Safety Equipment P.O. Box 385 White Oak Pike Cythiana, KY 40031
STAGE 6 ALUMINUM-WIRE SPRAYING			
1/8" Aluminum Wire (for flame spraying)	10 rolls	10 rolls	Open Purchase: METCO, Inc 1101 Prospect Avenue Westbury, NY
Oxygen	30 cylinders	30 cylinders	NSN 6830-00-169-0805
Acetylene	20 cylinders	20 cylinders	NSN 8120-00-268-3360
Gloves (cotton)	50 prs	50 prs	NSN 8415-00-268-8318
Respirator	50	50	NSN 4240-00-022-2524
STAGE 7 POWDER COATING			
Powder: Haze Grey White Red Black Yellow	1800 lbs 900 lbs 550 lbs 900 lbs. 250 lbs	200 lbs. 100 lbs. 50 lbs 100 lbs. 20 lbs.	Open Purchase: International Paint Powder Coatings 6003 Antoine Drive Houston, TX 77292-4224 Tiger Drylac USA, Inc 9587 Arrow Route, Suite K Rancho Cucamonga, CA 91730

Table A-1 SIMA (SF) CORROSION CONTROL SHOP CONSUMABLES LIST

ITEM	INITIAL STOCK	CONSUMPTION PER MONTH	NATIONAL STOCK NUMBER OR OPEN PURCHASE SOURCE
STAGE - POWDER COATING (Continued)			
Gloves (cotton)	20 prs	10 prs	NSN 8415-00-268-8318
Respirator (disposable, dust filter)	4 boxes	4 boxes	NSN 4240-00-629-8199
Hood (cotton)	20	20	NSN 8415-00-275-3159
Gloves, 500°F Heat Resistant	4 prs	2 prs	NSN 8415-00-092-3910
1/8" Aluminum Wire (for suspension)	200 ft	100 ft	NSN 4010-00-222-4482
STAGE - PAINTING			
Respirator, Charcoal Filters	50	40	NSN 4240-00-022-2524
Cheesecloth (strainer)	2 rolls	1 roll	NSN 8305-00-170-5063
TT-E- - EGM Solvent	40 gals	40 gals	NSN 6810-00-222-2751
Formul 150 - Green Primer (type II)	120 gals	120 gals	NSN 8010-00-437-6757
Form 151 - Haze Grey (type II)	100 gals	100 gals	NSN 8010-00-410-8460
Form 20 - Ext. Grey Deck	20 gals	20 gals	NSN 8010-00-286-9083
TT-E 49 White Enamel	8 gals	8 gals	NSN 8010-00-145-0165
TT-E- Haze Grey Enamel	40 gals	40 gals	NSN 8010-00-917-2256
DoD-I 555(SH) Heat Resistant Alumi n Paint	40 gals	40 gals	NSN 8010-01-033-3778
Glove astic)	100 prs	100 prs	NSN 6515-01-149-8842

Table A-1 SIMA (SF) CORROSION CONTROL SHOP CONSUMABLES LIST

ITEM	INITIAL STOCK	CONSUMPTION PER MONTH	NATIONAL STOCK NUMBER OR OPEN PURCHASE SOURCE
STAGE 9 - INSTALLATION KIT DISTRIBUTING			
Anti-Seize Compound	40 tubes	40 tubes	NSN 8030-00-292-1102
Polysulfide Sealant, Type I	25 cans	25 cans	NSN 8050-00-762-8807
Polysulfide Sealant, Type IV	25 cans	25 cans	NSN 8030-00-871-8489
Plastic Bags 6"	200	200	NSN 8105-00-837-7756
Plastic Bags 4"	100	100	NSN 8105-00-837-7753
Plastic Bags 12"	100	50	NSN 8105-00-837-7757
Toggle Pin, 1/2"x 2 1/2", 304 SS	78	As required	NSN 5315-00-664-0462
Toggle Pin, 1/2"x 4", 304 SS	134	As required	NSN 5315-00-664-0463
Toggle Pin, 5/8"x 2 1/2", 304 SS	50	As required	NSN 5315-00-664-0464
Toggle Pin, 5/8"x 5 1/2", 304 SS	696	As required	NSN 5315-00-664-0465
Hinge Pin (raise hatch)	122	As required	NSN 5315-00-753-3875
Washer (raised hatch)	122	As required	NSN
Cotter Pin	1074	As required	NSN 5315-00-187-9460
Hinge Pin (scuttle)	188	As required	NSN 5315-00-802-1837
Collar (scuttle)	364	As required	NSN 5315-01-082-2171
Upper Link Pin (scuttle)	88	As required	NSN 5315-01-140-9950
Lower Link Pin (scuttle)	88	As required	NSN 5315-01-142-3595
Collar Link Pin	88	As required	NSN 2040-01-093-1079

Table A-1 SIMA (SF) CORROSION CONTROL SHOP CONSUMABLES LIST

ITEM	INITIAL STOCK	CONSUMPTION PER MONTH	NATIONAL STOCK NUMBER OR OPEN PURCHASE SOURCE
STAGE 9 - INSTALLATION KIT DISTRIBUTING (Continued)			
Hinge Pin (Flush Deck Hatch)	28	As required	NSN 9510-00-189-7383
Washer (Flush Deck Hatch)	22	As required	NSN
Hinge Pin (Door)	952	As required	NSN 5315-00-841-1390
Collar (Door)	952	As required	NSN 3040-00-152-8830

☆ U.S. GOVERNMENT PRINTING OFFICE 1982 605 972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO 01 / NO OF SHEETS 12	5 REQUISITION DATE
6 REQUISITION NUMBER	
1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO	7 DATE MATERIAL REQUIRED
8 PRIORITY	
2 TO:	9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)
10 SIGNATURE	11a VOUCHER NUMBER AND DATE
3 SHIP TO / MARK FOR	12 DATE SHIPPED
	13 MODE OF SHIPMENT
14 BILL OF LADING NUMBER	
	15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	FURNISH TYPE I HEXAGONAL HEAD BOLTS IN ACCORDANCE WITH MIL-S-1222H; (STUDS, BOLTS, HEX CAP SCREWS, SOCKET HEAD CAP SCREWS AND NUTS"; DATED 21 OCTOBER 1986). THE BOLTS SHALL BE MADE OF CORROSION RESISTANT AUSTENTIC STEEL, MATERIAL GRADE (ALLOY) 316, IN ACCORDANCE WITH ASTM F 593-85. THE FASTENERS SHALL BE COLD WORKED; WASHER FACED AND INDIVIDUALLY MARKED WITH THE MATERIAL GRADE, IN ACCORDANCE WITH MIL-S-1222H. THE DEMENSIONS OF THE BOLTS SHALL BE IN ACCORDANCE WITH CABLE 2 OF ANSI B18.2.1 - 1981, SQUARE AND HEX BOLTS AND SCREWS INCH SERIES. THE THREADS SHALL BE UNIFIED NATIONAL COARSE THREAD SERIES, CLASS 2A. THE BOLTS SHALL BE PROVIDED IN THE FOLLOWING SIZES AND QUANTITIES (DIMENSIONS ARE IN INCHES UNLESS OTHERWISE STATED):							

16 TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO

17 SPECIAL HANDLING

18 RECAPITULATION OF SHIPMENT	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
ISSUED BY					
CHECKED BY					
PACKED BY					
			← TOTAL →		

19 RECEIPT				
CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL	
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL	
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO	

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM 1 MAR 80 1149 (9 - PT)

S/N 0102 LF 011 1801

ORIGINAL

A-8

U.S. GOVERNMENT PRINTING OFFICE 1982 605-972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO: 02 | NO. OF SHEETS: 12 | 5. REQUISITION DATE | 6. REQUISITION NUMBER

1. FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

2. TO

7. DATE MATERIAL REQUIRED | 8. PRIORITY

9. AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10. SIGNATURE | 11. VOUCHER NUMBER AND DATE

3. SHIP | MARK FOR

12. DATE SHIPPED

13. MODE OF SHIPMENT | 14. BILL OF LADING NUMBER

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4. APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)				UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	NOMINAL SIZE	UNC THREAD	LENGTH	COST CODE							
01	10	24	1/2		EA	100				.05	$ 5.00
02	10	24	3/4		EA	100				.05	5.00
03	10	24	1		EA	950				.08	76.00
04	1/4	20	3/4		EA	200				.08	16.00
05	1/4	20	1		EA	2000				.08	160.00
06	1/4	20	1 1/4		EA	50				.09	4.50

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO | 17. SPECIAL HANDLING

18. RECAPITULATION OF SHIPMENT	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	19. RECEIPT		DATE	BY	
PACKED BY							CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
CHECKED BY							QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
PACKED BY							POSTED	DATE	BY	20. RECEIVER'S VOUCHER NO
			← TOTAL →							

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ORIGINAL

☆ U.S. GOVERNMENT PRINTING OFFICE 1982 - 605 972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
03	12		

1 FROM
SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

2 TO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE
CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11a VOUCHER NUMBER AND DATE

3 SHIP [illegible] MARK FOR | 12 DATE SHIPPED | b

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPR [illegible] ION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CON TAINER (f)	CON TAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	[illegible] MINAL SIZE / UNC THREAD / LENGTH / COST CODE							
07	[illegible]/4 20 1 1/2	EA	200				.09	$ 18.00
08	[illegible]/4 20 1 3/4	EA	50				.10	5.00
09	[illegible]/16 18 3/4	EA	550				.046	25.30
10	[illegible]/16 18 1	EA	1400				.047	65.80
11	[illegible]/16 18 1 1/2	EA	50				.061	3.05
12	[illegible]/16 18 1 2/4	EA	50				.061	3.05

16 TRANSPORTATION VIA MATS OR [illegible] S CHARGEABLE TO

17 SPECIAL HANDLING

18 RECAPITULATION OF SHIPMENT	TOTAL CONTAINER	TYPE CON TAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
[illegible] D BY					
[illegible] HED BY					
PA[illegible]D BY			TOTAL →		

19 RECEIPT		DATE	BY	
	CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
	POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM MAR 80 1149 (9 - PT)

[illegible] EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102 LF 011 1801

ORIGINAL

A-10

U.S. GOVERNMENT PRINTING OFFICE: 1982 - 605-872

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 26 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

1 FROM: SUBRE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO	SHEET NO 04	NO OF SHEETS 12	5 REQUISITION DATE
	6 REQUISITION NUMBER		
	7 DATE MATERIAL REQUIRED		8 PRIORITY
	9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)		
	10 SIGNATURE		11a VOUCHER NUMBER AND DATE
3 SHIP MARK FOR	12 DATE SHIPPED		6
	13 MODE OF SHIPMENT		14 BILL OF LADING NUMBER
	15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO		

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	NOMINAL SIZE / UNC THREAD / LENGTH / COST CODE							
13	16 / 18 / 2	EA	150				.080	$ 12.00
14	16 / 18 / 2 1/2	EA	100				.099	9.90
15	16 / 18 / 3 1/2	EA	50				.100	5.00
16	3 / 16 / 3/4	EA	1400				.064	89.60
17	3 / 16 / 1	EA	3400				.074	251.60
18	3 / 16 / 1 1/4	EA	2000				.079	158.00

16 TRANSPORTATION VIA MATS OR MSC CHARGEABLE TO

17 SPECIAL HANDLING

18 RECAPITULATION OF SHIPMENT	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
PACKED BY					
RECEIVED BY					
SHIPPED BY					
			← TOTAL →		

19 RECEIPT				
CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL	
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL	
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO	

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED S/N 0102-LF-011-1801

ORIGINAL

A-11

★ U.S. GOVERNMENT PRINTING OFFICE: 1982 - 605-972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
05	12		

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

2 TO:

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE: (ORDER)ION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11 VOUCHER NUMBER AND DATE

3 SHIP TO MARK FOR

12 DATE SHIPPED | a.

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CON TAINER (f)	CON TAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	NOMINAL SIZE / UNC THREAD / LENGTH / COST CODE							
19	3/8 / 16 / 1 1/2	EA	2600				.090	$ 234.00
20	3/8 / 16 / 1 3/4	EA	1400				.100	140.00
21	3/8 / 16 / 2	EA	200				.110	22.00
22	3/8 / 16 / 2 1/2	EA	300				.134	40.20
23	3/8 / 16 / 3 1/2	EA	50				.144	7.20
24	7/16 / 14 / 1	EA	650				.104	67.60

16 TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO

17 SPECIAL HANDLING

18 RECAPITULATION OF SHIPMENT	TOTAL CONTAINER	TYPE CON TAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
ISSUED BY					
CHECKED BY					
PACKED BY					
			TOTAL		

19 RECEIPT

	DATE	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1 MAR 59 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ORIGINAL

A-12

☆ U.S. GOVERNMENT PRINTING OFFICE: 1982 - 605-972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
06	12		

1 FROM
SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE
CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11a VOUCHER NUMBER AND DATE

2 SHIP MARK FOR | 12 DATE SHIPPED | b.

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	NOMINAL SIZE / UNC THREAD / LENGTH / COST CODE							
25	5/16 / 14 / 1 3/4	EA	50				.151	$ 7.55
26	5/16 / 14 / 2 1/2	EA	50				.203	10.15
27	5/16 / 14 / 4	EA	50				.318	15.90
28	1/2 / 13 / 3/4	EA	50				.125	6.25
29	1/2 / 13 / 1	EA	50				.140	7.00
30	1/2 / 13 / 1 1/4	EA	150				.145	21.75

16 TRANSPORTATION VIA MATS OR AMTS CHARGEABLE TO

17 SPECIAL HANDLING

18 RECAPITULATION OF SHIPMENT	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
PACKED BY					
CHECKED BY					
LOADED BY					
			← TOTAL →		

19 RECEIPT

CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM MAR 80 1149 (9-PT)

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102 LF 011 1801

ORIGINAL

A-13

☆ U.S. GOVERNMENT PRINTING OFFICE 1982 - 605 872

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO		SHEET NO 07 / NO OF SHEETS 12	5 REQUISITION DATE
		6 REQUISITION NUMBER	7 DATE MATERIAL REQUIRED
		8 PRIORITY	9 AUTHORIZATION: CORROSION CONTROL SHOP SIMA(SF)
		10 SIGNATURE	11a VOUCHER NUMBER AND DATE
3 SHIP [illegible] CARR FOR		12 DATE SHIPPED	
		13 MODE OF SHIPMENT	14 BILL OF LADING NUMBER
		15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO	

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	[illegible]INAL [illegible]ZE UNC THREAD LENGTH COST CODE							
31	[illegible] 13 1 1/2	EA	1500				.159	$ 238.50
32	[illegible] 13 1 3/4	EA	150				.179	26.85
33	1 [illegible] 13 2	EA	550				.201	110.00
34	[illegible] 13 2 1/2	EA	300				.243	72.90
35	[illegible] 13 3	EA	50				.245	12.25
36	9 [illegible]6 12 1 1/2	EA	50				.307	15.35

16 TRANSPORTATION VIA MATS OR CHARGEABLE TO

17 SPECIAL HANDLING

18 RECAPITULATION OF SHIPMENT	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
PACKED BY					
[illegible] D BY					
PACK [illegible] BY					
			← TOTAL →		

19 RECEIPT		DATE	BY	
	CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
	POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ORIGINAL

A-14

☆ U.S. GOVERNMENT PRINTING OFFICE 1981 — 805 872

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
08	12		

FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED — 8 PRIORITY

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE — 11a VOUCHER NUMBER AND DATE

1 SHIP — MARK FOR — 12 DATE SHIPPED — b.

13 MODE OF SHIPMENT — 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

a. APPN AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CON TAINER (f)	CON TAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	MINAL IZE — UNC (THREAD) — LENGTH — COST CODE							
37	16 — 12 — 2 1/2	EA	400				.409	$ 163.60
38	16 — 12 — 3	EA	50				.42	21.00
39	8 — 11 — 1 1/2	EA	200				.328	65.60
40	8 — 11 — 2	EA	150				.367	55.05
41	8 — 11 — 2 1/2	EA	750				.437	327.75
42	8 — 11 — 3	EA	500				.506	253.00

16 TRANSPORTATION VIA MATS — CHARGEABLE TO — 17 SPECIAL HANDLING

18 RECAPITULATION OF SHIPMENT	TOTAL CONTAINER	TYPE CON TAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
			TOTAL →		

19 RECEIVED BY

CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED — S/N 0102-LF-011-1801

ORIGINAL

A-15

A-16

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

1 FROM: SURE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO	SHEET NO 09	NO OF SHEETS 13	5 REQUISITION DATE
	6 REQUISITION NUMBER		
	7 DATE MATERIAL REQUIRED		8 PRIORITY
	9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)		
	10 SIGNATURE		11a VOUCHER NUMBER AND DATE
1 SHIP [illegible] MARK FOR	12 DATE SHIPPED		a.
	13 MODE OF SHIPMENT		14 BILL OF LADING NUMBER
	15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO		

1 APPR [illegible] IN AND SUBHEAD	OBJ CL	SUB CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CON TAINER (f)	CON TAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	NOMINAL SIZE / THREAD / LENGTH / COST CODE							
43	3 / 11 / 3 1/2	EA	650				.606	$ 393.90
44	3 / 11 / 4	EA	50				.678	33.90
45	4 / 10 / 1	EA	50				.7	35.00
46	4 / 10 / 1 1/4	EA	50				.7	35.00
47	4 / 10 / 1 1/2	EA	50				.7	35.00
48	4 / 10 / 1 3/4	EA	50				.75	37.50

16 TRANS[illegible]RTATION VIA MATS [illegible] CHARGEABLE TO

17 SPECIAL HANDLING

18	BY	TOTAL CONTAINER	TYPE CON TAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
	TOTAL →					

19 RECEIPT		DATE	BY	
	CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
	POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD [illegible] 1149 (9 PT)

ORIGINAL

U.S. GOVERNMENT PRINTING OFFICE 1982 605-872

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO: 10 | NO. OF SHEETS: 12 | 5. REQUISITION DATE | 6. REQUISITION NUMBER

1. FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7. DATE MATERIAL REQUIRED | 8. PRIORITY

9. AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10. SIGNATURE | 11. VOUCHER NUMBER AND DATE

3. SHIP TO / MARK FOR

12. DATE SHIPPED

13. MODE OF SHIPMENT | 14. BILL OF LADING NUMBER

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4. APPROPRIATION AND SUBHEAD | OBJ CL | BUR CONT NO | SUBAL LOT | AUTHORIZATION ACCT G ACTIVITY | TRANS TYPE | PROPERTY ACCT G ACTIVITY | COUNTRY | COST CODE | AMOUNT

ITEM NO. (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)				UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	NOMINAL SIZE	UNC THREAD	LENGTH	COST CODE							
49		10	2		EA	50				.75	$ 37.50
50		10	2 1/2		EA	50				.77	38.50
51		10	3		EA	200				.79	158.00
52		10	3 1/2		EA	1100				.79	869.00
53		10	4 1/2		EA	50				.81	40.50
54		10	6		EA	50				.85	42.50

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO | 17. SPECIAL HANDLING

18. RECAPITULATION OF SHIPMENT: ISSUED BY / CHECKED BY / PACKED BY | TOTAL CONTAINER | TYPE CONTAINER | DESCRIPTION | TOTAL WEIGHT | TOTAL CUBE | ← TOTAL →

19. RECEIPT: CONTAINERS RECEIVED EXCEPT AS NOTED — DATE — BY | QUANTITIES RECEIVED EXCEPT AS NOTED — DATE — BY | POSTED — DATE — BY

SHEET TOTAL | GRAND TOTAL | 20. RECEIVER'S VOUCHER NO.

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ORIGINAL

☆ U.S. GOVERNMENT PRINTING OFFICE: 1982 - 605-872

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO	SHEET NO 11 / NO OF SHEETS 12 · 5 REQUISITION DATE · 6 REQUISITION NUMBER
2 TO:	7 DATE MATERIAL REQUIRED · 8 PRIORITY
	9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)
	10 SIGNATURE · 11a VOUCHER NUMBER AND DATE
3 SHIP TO / MARK FOR	12 DATE SHIPPED · a.
	13 MODE OF SHIPMENT · 14 BILL OF LADING NUMBER
	15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPROPR / AND SUBHEAD	OBJ CL	SUB / WORK CENTER NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	NOMINAL SIZE / UNC THREAD / LENGTH / COST CODE							
55	9	3 1/2	EA	400			.9	$ 360.00
56	9	4 1/2	EA	750			.9	675.00
57	8	9 1/2	EA	20			.95	19.50

16 TRANSPORTATION VIA MATS OR MSC CHARGEABLE TO

17 SPECIAL HANDLING

18 RECEIPT OF SHIPMENT: RECEIVED BY / PACKED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
			TOTAL →		

19 RECEIPT

	DATE	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

S/N 0102-LF-011-1801 ORIGINAL

A-18

★ U.S. GOVERNMENT PRINTING OFFICE: 1982 - 605-972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

1 FROM: SUBRE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO	SHEET NO 12	NO OF SHEETS 12	5 REQUISITION DATE
	6 REQUISITION NUMBER		
	7 DATE MATERIAL REQUIRED		8 PRIORITY
	9 AUTHORITY OR PURPOSE: CORROSION CONTROL SUBE SIMA(SF)		
	10 SIGNATURE		11a VOUCHER NUMBER AND DATE
3 SHIP TO / MARK FOR	12 DATE SHIPPED		14
	13 MODE OF SHIPMENT		14 BILL OF LADING NUMBER
	15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO		

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS. THREE SOURCES OF SUPPLY ARE PROVIDED: FALCON METAL CORP. 10715 John Price Road Dept. T P.O. Box 7429 Charlotte, NC 28217 1-800-438-0332 STOCK EXCHANGER P.O. Box 249 Canton, TX 75103 PH: 214-848-8561 SAMSON INDUSTRIES, INC. 3440-A Overland Ave. Los Angeles, CA 90034 213-559-3845							

16 TRANSPORTATION VIA MATS OR MSC CHARGEABLE TO

17 SPECIAL HANDLING

18 RECEIPT OF SHIPMENT	BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
				TOTAL →		

19 RECEIPT				
CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL	
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL	
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO	

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102-LF-011-1801

ORIGINAL

A-19

☆U.S. GOVERNMENT PRINTING OFFICE 1982 - 605 872

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
01	04		

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

2 TO:

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11a VOUCHER NUMBER AND DATE

3 SHIP TO / MARK FOR | 12 DATE SHIPPED | b.

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	FURNISH TYPE I HEXAGONAL HEAD NUTS IN ACCORDANCE WITH MIL-S-122H; ("STUDS, BOLTS, HEX CAP SCREWS, SOCKET HEAD CAP SCREWS AND NUTS", DATED 21 OCTOBER 1986). THE NUTS SHALL BE MADE OF CORROSION RESISTANT AUSTENTIC STEEL, MATERIAL GRADE (ALLOY) 316, IN ACCORDANCE WITH ASTM F 593-85,. THE FASTENERS SHALL BE COLD WORK: WASHER FACED, AND INDIVIDUALLY MARKED WITH THE MATERIAL GRADE, IN ACCORDANCE WITH CABLE 2 IF ANSI B18.2.1-1981, SQUARE AND HEX BOLTS AND SCREWS INCH SERIES. THE THREADS SHALL BE PROVIDED IN THE FOLLOWING SIZES AND QUANTITIES (DIMENSIONS ARE IN INCHES UNLESS OTHERWISE STATED):							

16 TRANSPORTATION VIA MATS OR MSC CHARGEABLE TO

17 SPECIAL HANDLING

18 RECAPITULATION OF SHIPMENT	PACKED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
	SHIPPED BY					
	PACKED BY					
				← TOTAL →		

19 RECEIPT				
CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL	
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL	
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO	

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ORIGINAL

A-20

☆ U.S. GOVERNMENT PRINTING OFFICE: 1982 - 605-972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO. OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
02	04		

1 FROM
SUBRE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

2 TO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE
CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11A VOUCHER NUMBER AND DATE

3 SHIP / MARK FOR

12 DATE SHIPPED | A

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APP[illegible]ION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	[illegible]HINAL [illegible]ZE UNC THREAD) COST CODE							
01	24	EA	1300				.30	$ 390.00
02	[illegible] 20	EA	5000				.43	2150.00
03	[illegible]6 18	EA	500				.45	225.00
04	[illegible] 16	EA	8600				.67	5762.00
05	[illegible]6 14	EA	200				.19	38.00
06	[illegible] 13	EA	2600				.15	390.00

16 TRANS[illegible]ORTATION VIA MATS (OR M[illegible]S CHARGEABLE TO

17 SPECIAL HANDLING

18 RECEIPT/INSPECTION OF SHIPMENT	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
[illegible] BY					
CHE[illegible]ED BY					
[illegible] D BY					
			← TOTAL →		

19 RECEIPT		DATE	BY	SHEET TOTAL
	CONTAINERS RECEIVED EXCEPT AS NOTED			
	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
	POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102-LF-011-1801

ORIGINAL

A-21

☆ U.S. GOVERNMENT PRINTING OFFICE 1982 605 072

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
03	04		

1 FROM
SUBRE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

2 TO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE
CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11A VOUCHER NUMBER AND DATE

3 SHIP TO / MARK FOR

12 DATE SHIPPED | A

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	NOMINAL SIZE UNC THREAD COST CODE							
07	6 12	EA	500				.26	$ 130.00
08	11	EA	2300				.35	805.00
09	7 9	EA	1100				.45	495.00
10	8	EA	20				.56	11.20

A-23

16 TRANSPORTATION VIA MATS OR MSC CHARGEABLE TO

17 SPECIAL HANDLING

18 RECEIPT OF SHIPMENT	SHIPPED BY / CHECKED BY / PACKED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
				← TOTAL →		

19 RECEIPT		DATE	BY	SHEET TOTAL
	CONTAINERS RECEIVED EXCEPT AS NOTED			
	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
	POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1 MAR 59 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102 LF 011 1801*

ORIGINAL

☆ U.S. GOVERNMENT PRINTING OFFICE: 1982 — 605 972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
04	04		

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

2 TO:

7 DATE MATERIAL REQUIRED:

8 PRIORITY:

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE:

11a VOUCHER NUMBER AND DATE:

3 SHIP / MARK FOR:

12 DATE SHIPPED:

13 MODE OF SHIPMENT:

14 BILL OF LADING NUMBER:

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPROPRIATION AND SUBHEAD	OBJ CL	SUB CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS. THREE SOURCES OF SUPPLY ARE PROVIDED: FALCON METAL CORP. 10715 John Price Road Dept. T P.O. Box 7429 Charlotte, NC 28217 1-800-438-0332 STOCK EXCHANGER P.O. Box 249 Canton, TX 75103 PH: 214-848-8561 SAMSON INDUSTRIES, INC. 3440-A Overland Ave. Los Angeles, CA 90034 213-559-3845							

16 TRANSPORTATION VIA MATS OR V / CHARGEABLE TO

17 SPECIAL HANDLING

18 RECAPITULATION OF SHIPMENT		TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
	BY					
	D BY					
	BY					
				TOTAL		

19 RECEIPT				
	CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
	POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM 1149 (9-PT)

ORIGINAL

A-23

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO 01 / NO OF SHEETS 03	5 REQUISITION DATE
6 REQUISITION NUMBER	
1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO	7 DATE MATERIAL REQUIRED
8 PRIORITY	
2 TO:	9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)
10 SIGNATURE	11a VOUCHER NUMBER AND DATE
3 SHIP / MARK FOR	12 DATE SHIPPED
	13 MODE OF SHIPMENT
	14 BILL OF LADING NUMBER
	15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPROPRIATION AND SUBHEAD	OBJ CL	SUB CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	FURNISH HEXAGONAL LOCK NUTS. THE NUTS SHALL BE MADE OF CORROSION RESISTANT AUSTENTIC STEEL, MATERIAL GRADE (ALLOY) 316, IN ACCORDANCE WITH ASTMF 593-85. THE FASTENERS SHALL BE COLD WORKED AND INDIVIDUALLY MARKED WITH THE MATERIAL GRADE, IN ACCORDANCE WITH MIL-S-1222H. THE LOCK NUTS SHALL BE OF THE PLASTIC INSERT TYPE. THE THREADS SHALL BE UNIFIED NATIONAL COURSE THREAD SERIES, BLASTS 2A. THE NUTS SHALL BE PROVIDED IN THE FOLLOWING SIZES AND QUANTITIES (DIMENSIONS ARE IN INCHES UNLESS OTHERWISE STATE).							

16 TRANSPORTATION VIA MATS OR MSC CHARGEABLE TO

17 SPECIAL HANDLING

18 RELEASED BY / RECEIVED BY / PACKED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
			TOTAL →		

19 RECEIPT

	DATE	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM 1149 (19 - PT)

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102 LF 011 1801

ORIGINAL

A-24

U.S. GOVERNMENT PRINTING OFFICE 1982 605-972

SHIPPING CONTAINER TALLY → 1–50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO 02 | NO OF SHEETS 03 | 5 REQUISITION DATE | 6 REQUISITION NUMBER

7 DATE MATERIAL REQUIRED | 8 PRIORITY

FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11 VOUCHER NUMBER AND DATE

SHIP / MARK FOR

12 DATE SHIPPED

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

APPROPRIATION AND SUBHEAD | OBJ CL | BUR CONT NO | SUBAL LOT | AUTHORIZATION ACCT G ACTIVITY | TRANS TYPE | PROPERTY ACCT G ACTIVITY | COUNTRY | COST CODE | AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)			UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	NOMINAL SIZE	UNC THREAD	COST CODE							
01	4	20		EA	100				.45	$ 45.00
02	16	18		EA	20				.45	9.00
03	8	16		EA	500				.70	350.00
04	2	13		EA	350				.25	87.00
05	8	11		EA	50				.40	20.00

16 TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO | 17 SPECIAL HANDLING

	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
ISSUED BY					
CHECKED BY					
PACKED BY					
			← TOTAL →		

19 RECEIPT		DATE	BY	
	CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
	POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1 MAR 58 1149 (9 PT) 51–100

REPLACES EDITION OF 1 MAY 50 WHICH MAY BE USED

S/N 0102-LF-011-1801

ORIGINAL

A-26

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO	SHEET NO 03	NO OF SHEETS 03	5 REQUISITION DATE
	6 REQUISITION NUMBER		
	7 DATE MATERIAL REQUIRED		8 PRIORITY
	9 AUTHORIZED PURPOSE: CORROSION CONTROL SHOP SIMA(SF)		
	10 SIGNATURE		11 VOUCHER NUMBER AND DATE
2 SHIP TO / MARK FOR	12 DATE SHIPPED		
	13 MODE OF SHIPMENT		14 BILL OF LADING NUMBER
	15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO		

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS. THREE SOURCES OF SUPPLY ARE PROVIDED: FALCON METAL CORP. 10715 John Price Road Dept. T P.O. Box 7429 Charlotte, NC 28217 1-800-438-0332 STOCK EXCHANGER P.O. Box 249 Canton, TX 75103 PH: 214-848-8561 SAMSON INDUSTRIES, INC. 3440-A Overland Ave. Los Angeles, CA 90034 213-559-3845							

16 TRANSPORTATION VIA MATS OR MSC CHARGEABLE TO

17 SPECIAL HANDLING

18 SHIPMENT OR RECEIPT		TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	19 RECEIPT		DATE	BY	SHEET TOTAL
								CONTAINERS RECEIVED EXCEPT AS NOTED			
								QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
				TOTAL				POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM 1149 (9 PT)

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102 LF 011 1801

ORIGINAL

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO 01	NO OF SHEETS 04
5 REQUISITION DATE	6 REQUISITION NUMBER
7 DATE MATERIAL REQUIRED	8 PRIORITY
9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)	
10 SIGNATURE	11 VOUCHER NUMBER AND DATE
12 DATE SHIPPED	
13 MODE OF SHIPMENT	14 BILL OF LADING NUMBER
15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO	

FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

TO:

SHIP TO / MARK FOR

APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	[illegible]RNISH PLAIN WASHERS. THE WASHERS SHALL BE MADE OF [illegible]RROSION RESISTANT AUSTENITIC STEEL, MATERIAL GRADE [illegible]LOY) 316, IN ACCORDANCE WITH THE CHEMICAL [illegible]QUIREMENTS DESCRIBED IN TABLE 1 OR ASTM F 593-85. [illegible] WASHERS SHALL BE FREE FROM BURRS, LOOSE SCALE, S[illegible]ARP EDGES AND ALL OTHER DEFECTS THAT MIGHT AFFECT [illegible]EIR SERVICEABILITY. THEY SHALL HAVE A SURFACE FINISH [illegible]DUCED IN ACCORDANCE WITH ASTM A 380-78. THE W[illegible]SHERS SHALL BE FURNISHED WITHOUT AN ADDITIVE CHEMICAL [illegible] METALLIC FINISH AND SHALL BE INDIVIDUALLY MARKED [illegible]TH THE MATERIAL GRADE. STAMPING SHALL BE PERMANENT [illegible] BE RAISED OR DEPRESSED. STAMPING SHALL BE MADE [illegible]TH A LOW STRESS STAMP. WASHER DIMENSIONS SHALL BE IN [illegible]CORDANCE WITH TABLE 1A OF ANSI B18-22.1 - 1965, PLAIN W[illegible]SHERS.							

16 TRANSPORTATION VIA MATS OR M[illegible] CHARGEABLE TO

17 SPECIAL HANDLING

18	BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	19 RECEIPT		DATE	BY	
	[illegible] BY							CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
	[illegible]ED BY							QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
	[illegible] BY							POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO
				← TOTAL →							

DD FORM 1149 (9 PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

REPLACES EDITION OF 1 MAY 50 WHICH MAY BE USED

S/N 0102 LF 011 1801

ORIGINAL

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
02	04		

SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE
CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11a VOUCHER NUMBER AND DATE

SHIP TO MARK FOR | 12 DATE SHIPPED

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

a APPROPRIATION AND SUBHEAD	OBJ CL	SUB CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	FINAL WASHER COST CODE SIZE							
01		EA	2000				.20	$ 400.00
02	1	EA	10,000				.25	2500.00
03	6	EA	2,000				.05	100.00
04		EA	20,000				.07	1400.00
05	7 6	EA	1000				.30	300.00
06		EA	5300				.14	742.00

16 TRANSPORTATION VIA MATS OR MSC CHARGEABLE TO

17 SPECIAL HANDLING

18 SHIPPED BY / RECEIVED BY / PACKED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
			TOTAL →		

19 RECEIVED

	DATE	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM 1149 (9 PT)

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102 LF 011 1901

ORIGINAL

A-28

A-29

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
03	04		

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11 a VOUCHER NUMBER AND DATE

2 SHIP MARK FOR | 12 DATE SHIPPED | b

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

3 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	ORIGINAL WASHER COST CODE SIZE							
07	16	EA	1000				.20	$ 200.00
08	8	EA	4300				.20	860.00
09	4	EA	4300				.20	860.00
10	8	EA	1000				.20	200.00
11		EA	40				.30	12.00

16 TRANSPORTATION VIA MATS (IF SEPARABLE TO)

17 SPECIAL HANDLING

18 SHIPPING MARKS	TOTAL CONTAINERS	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	19 RECEIPT				
18a BY							CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
18b BY							QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
18c BY			TOTAL				POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM 1149 (9 PT)

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102 LF 011 1801

ORIGINAL

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO: 04 | NO. OF SHEETS: 04

5. REQUISITION DATE

6. REQUISITION NUMBER

7. DATE MATERIAL REQUIRED

8. PRIORITY

FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

9. AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10. SIGNATURE

11. VOUCHER NUMBER AND DATE

SHIP TO / MARK FOR

12. DATE SHIPPED

13. MODE OF SHIPMENT

14. BILL OF LADING NUMBER

15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO. (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS. THREE SOURCES OF SUPPLY ARE PROVIDED: FALCON METAL CORP. 10715 John Price Road Dept. T P.O. Box 7429 Charlotte, NC 28217 1-800-438-0332 STOCK EXCHANGER P.O. Box 249 Canton, TX 75103 PH: 214-848-8561 SAMSON INDUSTRIES, INC. 3440-A Overland Ave. Los Angeles, CA 90034 213-559-3845							

16. TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO

17. SPECIAL HANDLING

ISSUED BY / CHECKED BY / PACKED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	19 RECEIPT		DATE	BY	
			← TOTAL →				CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
							QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
							POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1149 (9 PT) MAR 59

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102-LF-011-1801

ORIGINAL

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
01	06		

SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE
CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11 VOUCHER NUMBER AND DATE

1 SHIP MARK FOR | 12 DATE SHIPPED | 2

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

3 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

4 FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CON TAINER (f)	CON TAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
FINISH TYPE I HEXAGONAL HEAD BOLTS IN ACCORDANCE WITH MIL-S-1222H, ("STUDS, BOLTS, HEX CAP SCREWS, SOCKET HEAD CAP SCREWS AND NUTS", DATED 21 OCTOBER 1986). THE BOLTS SHALL BE MADE OF LOW OR MEDIUM CARBON STEEL IN ACCORDANCE WITH SAE-GRADE 2. THE FASTENERS SHALL BE COLD WORKED; WASHER FACED: AND INDIVIDUALLY MARKED WITH THE MATERIAL GRADE, IN ACCORDANCE WITH MIL-S-1222H. THE DIMENSIONS OF THE BOLTS SHALL BE IN ACCORDANCE WITH TABLE 2 OF ANSI B18.2.1-1981, SQUARE AND HEX BOLTS AND SCREWS INCH SERIES. THE THREADS SHALL BE UNIFIED NATIONAL COARSE THREAD SERIES, CLASS 2A.							

16 TRANSPORTATION VIA MATS
CHARGEABLE TO

17 SPECIAL HANDLING

18 PACKED BY / SHIPPED BY / RECEIVED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
			TOTAL →		

19 RECEIPT

CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM MAR 89 1149 (9 PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102 LF 011 1801

ORIGINAL

A.31

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
02	06		

1 FROM: SUBRE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11a VOUCHER NUMBER AND DATE

2 SHIP MARK FOR | 12 DATE SHIPPED | b

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

a APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	NOMINAL SIZE / UNC THREAD / LENGTH / COST CODE							
01	16 18 1 1/4	EA	150					
02	8 16 1 1/4	EA	100					
03	8 16 1 1/2	EA	300					
04	8 16 1 3/4	EA	20					
05	8 16 2	EA	30					
06	8 16 2 1/2	EA	5					

16 TRANSPORTATION VIA MATS CHARGEABLE TO

17 SPECIAL HANDLING

18 RECEIVED AT / BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE

← TOTAL →

19 RECEIPT

CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM 1149 (9 PT) REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED S/N 0102 LF 011 1801 ORIGINAL

A-32

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS
03	06

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

5 REQUISITION DATE

6 REQUISITION NUMBER

7 DATE MATERIAL REQUIRED

8 PRIORITY

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE

11a VOUCHER NUMBER AND DATE

2 SHIP MARK FOR

12 DATE SHIPPED

13 MODE OF SHIPMENT

14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

3 APPROPRIATION AND SUBHEAD	OBJ CL	SUB CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	NOMINAL SIZE / UNC THREAD / LENGTH / COST CODE							
07	/8 16 4	EA	5					
08	/2 13 1 1/4	EA	100					
09	/2 13 1 1/2	EA	50					
10	/2 13 1 3/4	EA	50					
11	/2 13 2	EA	50					
12	/2 13 2 1/2	EA	10					

16 TRANSPORTATION VIA MATS OR COSTS CHARGEABLE TO

17 SPECIAL HANDLING

18 SHIPPED BY / PACKED BY / MARKED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
			TOTAL →		

19 RECEIPT

CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1149 (9 PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102 LF 011 1801

ORIGINAL

A-33

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO 04 | NO OF SHEETS 06 | 5 REQUISITION DATE | 6 REQUISITION NUMBER

FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11 VOUCHER NUMBER AND DATE

SHIP TO / MARK FOR

12 DATE SHIPPED

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)				UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	OMINAL SIZE	UNC THREAD	LENGTH	COST CODE							
13	/2	13	3		EA	10					
14	/16	12	1 1/2		EA	20					
15	/16	12	3		EA	30					
16	/16	12	4		EA	60					
17	/8	11	1 1/2		EA	10					
18	/8	11	2		EA	170					

TRANSPORTATION VIA MATS CHARGEABLE TO | 17 SPECIAL HANDLING

	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
ISSUED BY					
CHECKED BY					
PACKED BY					
			← TOTAL →		

19 RECEIPT				
CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM MAR 59 1149 (9 PT) REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED S/N 0102 LF 011 1801

ORIGINAL

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO	SHEET NO 05 / NO OF SHEETS 06	5 REQUISITION DATE	6 REQUISITION NUMBER
	7 DATE MATERIAL REQUIRED		8 PRIORITY
	9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)		
	10 SIGNATURE		11a VOUCHER NUMBER AND DATE
12 SHIP TO / MARK FOR	12 DATE SHIPPED		12a
	13 MODE OF SHIPMENT		14 BILL OF LADING NUMBER
	15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO		

1 APPROPRIATION AND SUBHEAD	OBJ CL	SUB CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

18 (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	MINAL SIZE / UNC THREAD / LENGTH / COST CODE							
19	8 / 11 / 2 1/2	EA	70					
20	8 / 11 / 3	EA	330					
21	4 / 10 / 1 1/2	EA	80					
22	4 / 10 / 2	EA	50					
23	4 / 10 / 2 1/2	EA	120					
24	4 / 10 / 3 1/2	EA	100					

16 TRANSPORTATION VIA MATS CHARGEABLE TO

17 SPECIAL HANDLING

18 SHIPPED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	19 RECEIPT		DATE	BY	SHEET TOTAL
PACKED BY							QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
PACKAGED BY							POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO
	← TOTAL →									

DD FORM 1149 (9 PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED S/N 0102 LF 011 1801

ORIGINAL

A-35

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

SHEET NO: 06 | NO. OF SHEETS: 06 | 5 REQUISITION DATE: | 6 REQUISITION NUMBER:

FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED: | 8 PRIORITY:

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE: | 11a VOUCHER NUMBER AND DATE:

SHIP TO / MARK FOR:

12 DATE SHIPPED: | 13 MODE OF SHIPMENT: | 14 BILL OF LADING NUMBER:

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO:

APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS.							

THREE SOURCES OF SUPPLY ARE PROVIDED:

FALCON METAL CORP.
10715 John Price Road
Dept. T
P.O. Box 7429
Charlotte, NC 28217
1-800-438-0332

STOCK EXCHANGER
P.O. Box 249
Canton, TX 75103
PH: 214-848-8561

SAMSON INDUSTRIES, INC.
3440-A Overland Ave.
Los Angeles, CA 90034
213-559-3845

16 TRANSPORTATION VIA MATS CHARGEABLE TO: | 17 SPECIAL HANDLING:

18	BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	19 RECEIPT		DATE	BY	
	…ED BY							CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
	…ED BY							QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
	…ED BY			← TOTAL →				POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM 1149 (9 PT)

REPLACES EDITION OF 1 MAY 50 WHICH MAY BE USED

S/N 0102 LF 011 1801

ORIGINAL

☆U.S. GOVERNMENT PRINTING OFFICE 1982 - 605 972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
01	03		

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

2 TO:

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11a VOUCHER NUMBER AND DATE

3 SHIP MARK FOR

12 DATE SHIPPED | 4

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	RNISH TYPE I HEXAGONAL NUTS IN ACCORDANCE WITH MIL-S- 222H, ("STUDS, BOLTS, HEX CAP SCREWS, SOCKET HEAD CAP REWS AND NUTS," DATED 21 OCTOBER 1986). THE NUTS ALL BE MADE OF LOW OR MEDIUM CARBON STEEL IN CORDANCE WITH SAE-GRADE 2. THE FASTENERS SHALL BE LD WORKED; WASHER FACED; AND INDIVIDUALLY MARKED WITH E MATERIAL GRADE, IN ACCORDANCE WITH MIL-S-1222H. E DIMENSIONS OF THE NUTS SHALL BE IN ACCORDANCE WITH BLE 2 OF ANSI B18.2.1 - 1981, SQUARE AND HEX BOLTS D SCREWS INCH SERIES. THE THREADS SHALL BE UNIFIED TIONAL COARSE THREAD SERIES, CLASS 2A.							

16 TRANSPORTATION VIA MATS
[illegible] CHARGEABLE TO

17 SPECIAL HANDLING

18 RECAPITULATION OF SHIPMENT	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
[illegible] BY					
[illegible] ED BY					
[illegible] D BY			TOTAL →		

19 RECEIPT				
CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL	
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL	
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO	

DD FORM MAR 58 1149 (9 - PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ORIGINAL

A-37

☆ U.S. GOVERNMENT PRINTING OFFICE: 1982 - 605 972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO 02 / NO OF SHEETS 03	5 REQUISITION DATE
6 REQUISITION NUMBER	
1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO	7 DATE MATERIAL REQUIRED
8 PRIORITY	
2 TO:	9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)
10 SIGNATURE	11a VOUCHER NUMBER AND DATE
3 SHIP TO / MARK FOR	12 DATE SHIPPED
	13 MODE OF SHIPMENT
14 BILL OF LADING NUMBER	
	15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	NOMINAL SIZE UNC COST CODE THREAD							
01	3/8 16	EA	420					
02	1/2 13	EA	110					
03	9/16 12	EA	110					
04	5/8 11	EA	800					
05	3/4 10	EA	300					

16 TRANSPORTATION VIA MATS OR MSTS CHARGEABLE TO

17 SPECIAL HANDLING

18 RECAPITULATION OF SHIPMENT	ISSUED BY	CHECKED BY	PACKED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
						TOTAL →		

19 RECEIPT		DATE	BY	SHEET TOTAL
	CONTAINERS RECEIVED EXCEPT AS NOTED			
	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
	POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM MAR 80 1149 (9 - PT)

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102 LF 011 1801

ORIGINAL

A-38

☆ U.S. GOVERNMENT PRINTING OFFICE 1982 605 972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO 03	NO OF SHEETS 03	5 REQUISITION DATE	6 REQUISITION NUMBER
1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO		7 DATE MATERIAL REQUIRED	8 PRIORITY
2 TO:		9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)	
		10 SIGNATURE	11a VOUCHER NUMBER AND DATE
3 SHIP / MARK FOR		12 DATE SHIPPED	a.
		13 MODE OF SHIPMENT	14 BILL OF LADING NUMBER
		15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO	

4 APP... ION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CON TAINER (f)	CON TAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS. THREE SOURCES OF SUPPLY ARE PROVIDED: FALCON METAL CORP. 10715 John Price Road Dept. T P.O. Box 7429 Charlotte, NC 28217 1-800-438-0332 STOCK EXCHANGER P.O. Box 249 Canton, TX 75103 PH: 214-848-8561 SAMSON INDUSTRIES, INC. 3440-A Overland Ave. Los Angeles, CA 90034 213-559-3845							

16 TRANSPORTATION CHARGES CHARGEABLE TO

17 SPECIAL HANDLING

18 RECAPITULATION OF SHIPMENT	ISSUED BY	TOTAL CONTAINER	TYPE CON TAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
	RECEIVED BY					
	PACKED BY					
				TOTAL →		

19 RECEIPT		DATE	BY	
	CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
	POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ORIGINAL

A-39

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
01	03		

1 FROM
SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE
CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11a VOUCHER NUMBER AND DATE

2 SHIP MARK FOR | 12 DATE SHIPPED | b

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
FURNISH PLAIN WASHERS. THE WASHERS SHALL BE MADE OF LOW OR MEDIUM CARBON STEEL IN ACCORDANCE WITH SAE-GRADE . THE WASHERS SHALL BE FREE FROM BURRS, LOOSE SCALE, SHARP EDGES AND ALL OTHER DEFECTS THAT MIGHT AFFECT THEIR SERVICEABILITY. THEY SHALL HAVE A SURFACE FINISH PRODUCED IN ACCORDANCE WITH ASTM A 380-78. THE WASHERS SHALL BE FURNISHED WITHOUT AN ADDITIVE CHEMICAL OR METALLIC FINISH AND SHALL BE INDIVIDUALLY MARKED WITH THE MATERIAL GRADE. STAMPING SHALL BE PERMANENT AND MAY BE RAISED OR DEPRESSED. STAMPING SHALL BE MADE WITH A LOW STRESS STAMP. WASHER DIMENSIONS SHALL BE IN ACCORDANCE WITH TABLE 1A OF ANSI B18.22.1 - 1965, PLAIN WASHERS.							

16 TRANSPORTATION VIA MATS
GBLS CHARGEABLE TO

17 SPECIAL HANDLING

18 SHIPPED BY / PACKED BY / MARKED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
			← TOTAL →		

19 RECEIPT

	DATE	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM MAR 58 1149 (9 PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102 LF 011 1801

ORIGINAL

A-40

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
02	03		

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11a VOUCHER NUMBER AND DATE

2 SHIP TO MARK FOR | 12 DATE SHIPPED | 11b

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

3 APPROPRIATION AND SUBHEAD	OBJ CL	SUB CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

4 FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
NOMINAL WASHER SIZE COST CODE							
0 /8	EA	800					
0 /2	EA	600					
0 /16	EA	220					
0 /8	EA	1300					
0 /4	EA	600					

16 TRANSPORTATION VIA MATS IF CHARGEABLE TO | 17 SPECIAL HANDLING

18 RELEASED BY / RECEIVED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	19 RECEIVED		DATE	BY	SHEET TOTAL
							CONTAINERS RECEIVED EXCEPT AS NOTED			
							QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
			TOTAL				POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM MAR 58 1149 (9 PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102 LF 011 1801

ORIGINAL

A-41

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
03	03		

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11A VOUCHER NUMBER AND DATE

2 SHIP/MARK FOR | 12 DATE SHIPPED | 11B

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPROPRIATION AND SUBHEAD	OBJ CL	SUB/WORK CENTER NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS. THREE SOURCES OF SUPPLY ARE PROVIDED: FALCON METAL CORP. 10715 John Price Road Dept. T P.O. Box 7429 Charlotte, NC 28217 1-800-438-0332 STOCK EXCHANGER P.O. Box 249 Canton, TX 75103 PH: 214-848-8561 SAMSON INDUSTRIES, INC. 3440-A Overland Ave. Los Angeles, CA 90034 213-559-3845							

16 PORTATION VIA UNITS OR IS CHARGEABLE TO

17 SPECIAL HANDLING

18 RELEASED BY / RECEIVED BY / RECEIVED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	19 RECEIPT		DATE	BY	SHEET TOTAL
							CONTAINERS RECEIVED EXCEPT AS NOTED			
							QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
							POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO
			← TOTAL →							

DD FORM MAR 59 1149 (9 PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED S/N 0102 LF 011 1801 **ORIGINAL**

A-42

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO 01 / NO. OF SHEETS 07	5 REQUISITION DATE
6 REQUISITION NUMBER	
1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO	7 DATE MATERIAL REQUIRED
8 PRIORITY	
9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)	
10 SIGNATURE	11a VOUCHER NUMBER AND DATE
1 SHIP MARK FOR	12 DATE SHIPPED
b	
13 MODE OF SHIPMENT	14 BILL OF LADING NUMBER
15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO	

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	APPLY CERAMIC COATING IN ACCORDANCE WITH MIL-C-81751B TYPE I CLASS TO THE SAE-GRADE 2 CARBON STEEL FASTENERS PROVIDED. COATING SYSTEM SHALL CONSIST OF SPECIFIED CERAMIC BASE COAT WITH HIGH TEMPERATURE SEALER (GRAY IN COLOR). APPLICABLE COATING PRODUCTS INCLUDE: SERMETEL 25 SYSTEM; XYLAR 1/XYLAR 101 SYSTEM; OR ALSEAL-518 AND ALSEAL 598 SYSTEM.							

16 TRANSPORTATION VIA MATS IS CHARGEABLE TO

17 SPECIAL HANDLING

18 SHIPPED BY / PACKED BY / CHECKED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
			TOTAL →		

19 RECEIVED

	DATE	BY	
CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1149 (9 PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ORIGINAL

A-43

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO: 02 | NO OF SHEETS: 07

5 REQUISITION DATE:
6 REQUISITION NUMBER:
7 DATE MATERIAL REQUIRED:
8 PRIORITY:

FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE:
11 VOUCHER NUMBER AND DATE:
SHIP TO / MARK FOR:
12 DATE SHIPPED:
13 MODE OF SHIPMENT:
14 BILL OF LADING NUMBER:
15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO:

APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
01	XAGONAL HEAD BOLTS 5/16-18 1 1/4"	EA	150					
02	XAGONAL HEAD BOLTS 3/8-16 1 1/4"	EA	100					
03	XAGONAL HEAD BOLTS 3/8-16 1 1/2"	EA	300					
04	XAGONAL HEAD BOLTS 3/8-16 1 3/4"	EA	20					
05	XAGONAL HEAD BOLTS 3/8-16 2"	EA	30					
06	XAGONAL HEAD BOLTS 3/8-16 2 1/2"	EA	5					
07	XAGONAL HEAD BOLTS 3/8-16 4"	EA	5					

16 TRANSPORTATION VIA MATS CHARGEABLE TO:
17 SPECIAL HANDLING:

18	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
...ED BY					
...ED BY					
...ED BY					
			← TOTAL →		

19 RECEIPT		DATE	BY	
	CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
	POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1149 (9 PT)

ORIGINAL

A-44

U.S. GOVERNMENT PRINTING OFFICE: 1982 605 972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO. OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
03	07		

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11a VOUCHER NUMBER AND DATE

2 SHIP TO / MARK FOR | 12 DATE SHIPPED | b.

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

a. APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CON TAINER (f)	CON TAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
08	NATIONAL HEAD BOLTS 1/2-13 1 1/4"	EA	100					
09	NATIONAL HEAD BOLTS 1/2-13 1 1/2"	EA	50					
10	NATIONAL HEAD BOLTS 1/2-13 1 3/4"	EA	50					
11	NATIONAL HEAD BOLTS 1/2-13 2"	EA	50					
12	NATIONAL HEAD BOLTS 1/2-13 2 1/2"	EA	10					
13	NATIONAL HEAD BOLTS 1/2-13 3"	EA	10					
14	NATIONAL HEAD BOLTS 9/16-12 1 1/2"	EA	20					

16 TRANSPORTATION VIA MATS CHARGEABLE TO | 17 SPECIAL HANDLING

SHIPPED BY	TOTAL CONTAINER	TYPE CON TAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	18 RECEIPT		DATE	BY	
PACKED BY							CONTAINERS RECEIVED EXCEPT AS NOTED			SHEET TOTAL
PACKED BY							QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
			TOTAL				POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM 1149 (9 PT)

S/N 0102 LF 011 1801

ORIGINAL

A-45

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO. OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
04	07		

1 FROM
ORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE
CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11a VOUCHER NUMBER AND DATE

2 MARK FOR | 12 DATE SHIPPED | a

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COSY CODE	AMOUNT

3 ITEM NO	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
15	XAGONAL HEAD BOLTS 9/16-12 3"	EA	30					
16	XAGONAL HEAD BOLTS 9/16-12 4"	EA	60					
17	XAGONAL HEAD BOLTS 5/8-11 1 1/2"	EA	10					
18	XAGONAL HEAD BOLTS 5/8-11 2"	EA	170					
19	XAGONAL HEAD BOLTS 5/8-11 2 1/2"	EA	70					
20	XAGONAL HEAD BOLTS 5/8-11 3"	EA	330					
21	XAGONAL HEAD BOLTS 3/4-10 1 1/2"	EA	80					

A-46

16 TRANSPORTATION VIA MATS
COSTS CHARGEABLE TO

17 SPECIAL HANDLING

18 PACKED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	19 RECEIPT		DATE	BY	SHEET TOTAL
							CONTAINERS RECEIVED EXCEPT AS NOTED			
CHECKED BY							QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
PACKED BY			TOTAL →				POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM AR 50 1149 (9 - PT)

S/N 0102-LF-011-1805

ORIGINAL

U.S. GOVERNMENT PRINTING OFFICE: 1982 — 605-972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO. OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
05	07		

1 FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11a. VOUCHER NUMBER AND DATE

2 SHIP MARK FOR | 12 DATE SHIPPED | b.

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

4 APP ...ION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
22	NATIONAL HEAD BOLTS 3/4-10 2"	EA	50					
23	NATIONAL HEAD BOLTS 3/4-10 2 1/2"	EA	120					
24	NATIONAL HEAD BOLTS 3/4-10 3 1/2"	EA	100					
25	NATIONAL NUTS 3/8-16	EA	420					
26	NATIONAL NUTS 1/2	EA	110					
27	NATIONAL NUTS 9/16	EA	110					
28	NATIONAL NUTS 5/8	EA	800					

16 TRANSPORTATION VIA MATS ... CHARGEABLE TO

17 SPECIAL HANDLING

18 SHIPPED BY / PACKED BY / MARKED BY	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
			TOTAL →		

19 RECEIPT				
CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL	
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL	
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO	

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

S/N 0102-LF-011-1801

ORIGINAL

A-47

U.S. GOVERNMENT PRINTING OFFICE: 1982 - 605-872

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO	NO OF SHEETS	5 REQUISITION DATE	6 REQUISITION NUMBER
06	07		

1 FROM
SECURE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE
CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11a VOUCHER NUMBER AND DATE

2 SHIP MARK FOR | 12 DATE SHIPPED | b.

13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

3 APPROPRIATION AND SUBHEAD	OBJ CL	SUB CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
29	HEXAGONAL NUTS 3/4	EA	300					
30	ALUMINUM WASHERS 3/8	EA	800					
31	ALUMINUM WASHERS 1/2	EA	600					
32	ALUMINUM WASHERS 9/16	EA	220					
33	ALUMINUM WASHERS 5/8	EA	1300					
34	ALUMINUM WASHERS 3/4	EA	600					

4 TRANSPORTATION VIA MATS
CHARGEABLE TO

17 SPECIAL HANDLING

18 RECAPITULATION OF SHIPMENT	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE
PACKED BY					
MARKED BY					
LOADED BY					
			TOTAL →		

19 RECEIPT

	DATE	BY	SHEET TOTAL
CONTAINERS RECEIVED EXCEPT AS NOTED			
QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

S/N 0102-LF-011-1801

ORIGINAL

A-48

U.S. GOVERNMENT PRINTING OFFICE 1982 605-972

SHIPPING CONTAINER TALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHEET NO 07 | NO. OF SHEETS 07 | 5 REQUISITION DATE | 6 REQUISITION NUMBER

FROM: SHORE INTERMEDIATE MAINTENANCE ACTIVITY SAN FRANCISCO

7 DATE MATERIAL REQUIRED | 8 PRIORITY

9 AUTHORITY OR PURPOSE: CORROSION CONTROL SHOP SIMA(SF)

10 SIGNATURE | 11 VOUCHER NUMBER AND DATE

SHIP TO / MARK FOR

12 DATE SHIPPED | 13 MODE OF SHIPMENT | 14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

APPROPRIATION AND SUBHEAD	OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUNTRY	COST CODE	AMOUNT

ITEM NO. (a)	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CONTAINER (f)	CONTAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)
	QUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS.							
	O SOURCES OF APPLICATION SERVICES ARE PROVIDED:							
	RMATECH INTERNATIONAL INC. 26 WEST ROSECRANS AVENUE WNDALE (L.A.), CA 90260 13) 973-1142							
	TALLIC CERAMICS COATINGS INC. O. BOX 1598 ST CHEST, PA 19380 15) 279-1212							

TRANSPORTATION VIA MATS CHARGEABLE TO | 17 SPECIAL HANDLING

	TOTAL CONTAINER	TYPE CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	19 RECEIPT		DATE	BY	
ISSUED BY							CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
CHECKED BY							QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
PACKED BY			← TOTAL →				POSTED	DATE	BY	20 RECEIVER'S VOUCHER NO

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DD FORM 1149 (9 PT)

S/N 0102-LF-011-1801

ORIGINAL

Procure the following amounts of powdered epoxy coatings in accordance with the attached specifications.

Color	Quantity	*Cost Per Lb.	*Total Cost
Haze Grey	1800 lbs	$2.70	$4860.00
Red	550 lbs	$4.65	$2557.50
White	900 lbs	$3.05	$2745.00
Yellow	250 lbs	$5.95	$1487.50
Flat Black	900 lbs	$3.00	$2700.00

(*Prices furnished by:
International Paint Powder Coatings
6003 Antoine Drive
Houston, TX 77292-4224
1-800-231-8044)

Furnished with the powders should be the following:

1. Material Safety Data Sheets: The contracting activity shall be provided a material safety data sheet (MSDS) at the time of contract award. The MSDS is OSHA-20 and is found in FED STD 313. The MSDS shall be included with the shipment of the material covered by this procurement.

2. Application Instructions: Application and curing instructions shall be included with the shipment of the material covered by this procurement.

Packaging requirements:

Powders shall be packaged in heavy duty plastic bags, and the plastic bags packed in cardboard boxes with cardboard stiffeners, sufficiently sealed to protect the contents from the environment. Size of packaging required is 50 lbs. Each package shall be marked with the following precautionary marking (or equivalent):

'DO NOT STORE AT TEMPERATURES ABOVE 27 °C (80 °F)'

POWDERED EPOXY FOR COATING PURPOSES

Description: Each color of powdered epoxy coating material shall be fine powder that is suitable for application to abrasive blasted steel and aluminum by established commercial powder coating methods. Each color of powder shall be a one-component compounded material that requires no blending, mixing, or addition of any other compounds to melt, fuse, and subsequently cure to form a coating when applied to a piece of metal and heated. The coating thus formed must be able to meet all the requirements described herein. The manufacturer shall specify the application procedures, curing requirements and limitations, and health and safety information necessary to assure optimum coating performance and personnel safety.

Requirements:

NOTE: Where coated test panels are referred to below, the coating shall be applied as follows, unless otherwise noted.

Test Panel Material: Steel test panels shall conform to ASTM A 366-65, cold rolled sheet (commercial quality), non copper-bearing, matte finish (exposed), not oiled, with minimum dimensions of 1/8" by 6" by 4". Aluminum test panels shall conform to ASTM B 209-86, alloy 5086, temper H116, mill finish with one bright side, flat sheet, with minimum dimensions of 1/8" by 6" by 4", and no other special tests or inspections required.

Surface Preparation: Panels shall be solvent washed in a 1:1 mixture (by volume) of xylene and isopropanol, rinsed in clean solvent, and dried. The entire panel shall be abrasive blasted to near white metal (SSPC-SP-10), with an anchor tooth profile of 2.0 to 3.0 mils, using any suitable equipment and abrasive blasting material. After blasting, the panels shall be cleaned using clean, dry, oil free compressed air or a vacuum.

Coating Application: Coatings shall be applied to one side of the panel in accordance with manufacturer's instructions, to a cured dry film thickness of 8-12 mils.

1. Toxicity: The material shall have no adverse effect on human health when used according to provided instructions and for its intended purpose. There shall be no lead, chromate or cadmium pigments, nor any other human carcinogenic or suspected human carcinogenic compounds. Waste powder and removed coating shall be non-toxic and capable of being disposed of in a public landfill.

2. Film Properties: The powder coating shall be capable of attaining a cured dry film thickness of 8-12 mils in no more than two coats. The coating shall be smooth, even and free of runs, sags, streaks, or other imperfections.

3. Adhesion: Prepare 2 steel test panels and 2 aluminum test panels. Test in accordance with the procedures of Method A of ASTM D 3359-83. The test shall be performed in three locations on each test panel. The average grade of the twelve tests rates

must be greater than 4.5A.

4. Abrasion Resistance: Prepare 4 steel test panels, either disks 4 inches in diameter or plates 4 inches square with rounded corners, with a 1/4" hole centrally located on each panel. Test in accordance with the procedures of ASTM D 4060-84 using a CS-17 abrasive wheel, a 1000 gram load, and a test period of 1000 cycles. The average weight loss per 1000 cycles for the four panels must be less than 50 milligrams.

5. Salt Water and Hydraulic Fluid Immersion Test: Prepare both sides of 4 steel test panels and 4 aluminum test panels, each with dimensions of 6" W x 12" L x 1/8" D. Immerse half the length of 2 steel and 2 aluminum panels in substitute ocean water made in accordance with ASTM D 1141-86 (without heavy metals). Immerse half the length of the other 2 steel and 2 aluminum panels in petroleum based hydraulic fluid in accordance with MIL-H-5606E. Both substitute ocean water and hydraulic fluid shall be maintained at 70°F ± 5°F. After 72 hours of immersion, the coating shall not have blistered, softened, or disbonded in any way. Discount any coating defects which occur within 1/2" of the plate edge.

6. Salt Spray Resistance: Prepare 2 steel test panels and 2 aluminum test panels as described at the beginning of this specification. Scribe the panels in accordance with the procedures of ASTM D 1654-79a. Expose the panels to salt spray in accordance with the procedures of ASTM B 117-73 for 1000 hours. Evaluate the scribed and unscribed areas according to Procedure A, Method 2 (Scraping) of ASTM D 1654-79a. The average of the four panel ratings of the representative mean creepage from the scribe must be greater than or equal to 4.5, and no panel can have a rating less than 4. The average of the four panel ratings of the unscribed area must be greater than or equal to 9, discounting any coating defects which occur within 1/2 of the plate edge.

7. Hardness: Prepare 1 steel test panel as described at the beginning of this specification. Determine the Scratch Hardness at 5 random places on the panel in accordance with the procedures of ASTM D 3363-74. The average of the 5 determinations shall be recorded as the hardness and the hardness must be a minimum of 2H.

8. Impact Resistance: Prepare 4 steel test panels in accordance with the dimensions and procedures of this specification, except apply the coating 6 - 10 mils thick. Using a 0.625 inch indenter, test the coating for impact resistance in accordance with the procedures of ASTM D 2794-84. Use a magnifier to examine the test panels. The minimum direct impact resistance of the all colors of coatings (except the flat black, which shall be exempt from this test) shall be 50 inch-pounds and the minimum reverse impact resistance shall be 40 inch-pounds.

9. Overbake Stability: The powder coating shall be able to sustain a 100% overbake (with respect to time, not temperature) without discoloration or any reduction in performance properties.

10. Color: View the prepared panels in artificial daylight with a light source in accordance with paragraph 5.1.1.2 of ASTM D 1729. The cured coating colors must match the following FED STD 595 color chips:

Haze Grey	FED-STD-595-26270
Red	FED-STD-595-21105
Yellow	FED-STD-595-23538
Flat Black	FED-STD-595-37038
White	FED-STD-595-27875

11. Gloss: Prepare 1 steel or aluminum test panel as described at the beginning of this specification. Determine the gloss of each color of powder in accordance with the procedures of ASTM D 523, using a 60° geometry. The mean specular gloss reading for red, yellow, white and haze grey shall be a minimum of 40 and a maximum of 100; and flat black shall be a minimum of 0 and a maximum of 10.

12. Shelf Life: The shelf life of the uncured resin shall not be less than one-year from the date of manufacture when stored in original unopened containers below 90°F and 50% relative humidity.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

2. AMENDMENT NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
0001	87 Mar 13	R68251/7006/6049 & 6051	

6. ISSUED BY CODE N00604

REGIONAL CONTRACTING DEPARTMENT
NAVAL SUPPLY CENTER
BOX 300
PEARL HARBOR, HAWAII 96860-5300

7. ADMINISTERED BY (If other than Item 6) CODE

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

CODE FACILITY CODE

(X) 9A. AMENDMENT OF SOLICITATION NO.: N00604-87-R-0041

X 9B. DATED (SEE ITEM 11): 87 Mar 13

10A. MODIFICATION OF CONTRACT/ORDER NO.

10B. DATED (SEE ITEM 13)

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

X The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, X is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning 1 COPY copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

☐ A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

☐ B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

☐ C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

☐ D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor ☐ is not, ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

See Page No. 2

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)
15B. CONTRACTOR/OFFEROR	16B. UNITED STATES OF AMERICA
Signature of person authorized to sign)	BY Signature of Contracting Officer

INSTRUCTIONS

Instructions for items other than those that are self-explanatory are as follows:

(a) Item 1 (Contract ID Code). Insert the contract type identification code that appears in the title block of the contract being modified.

(b) Item 3 (Effective date).

(1) For a solicitation amendment, change order, or administrative change, the effective date shall be the issue date of the amendment, change order, or administrative change.

(2) For a supplemental agreement, the effective date shall be the date agreed to by the contracting parties.

(3) For a modification issued as an initial or confirming notice of termination for the convenience of the Government, the effective date and the modification number of the confirming notice shall be the same as the effective date and modification number of the initial notice.

(4) For a modification converting a termination for default to a termination for the convenience of the Government, the effective date shall be the same as the effective date of the termination for default.

(5) For a modification confirming the contracting officer's determination of the amount due in settlement of a contract termination, the effective date shall be the same as the effective date of the initial decision.

(c) Item 6 (Issued By). Insert the name and address of the issuing office. If applicable, insert the appropriate issuing office code in the code block.

(d) Item 8 (Name and Address of Contractor). For modifications to a contract or order, enter the contractor's name, address, and code as shown in the original contract or order, unless changed by this or a previous modification.

(e) Items 9 (Amendment of Solicitation No.—Dated) and 10 (Modification of Contract/Order No.—Dated). Check the appropriate box and in the corresponding blanks insert the number and date of the original solicitation, contract, or order.

(f) Item 12 (Accounting and Appropriation Data). When appropriate, indicate the impact of the modification on each affected accounting classification by inserting one of the following entries:

(1) Accounting classification
Net increase $

(2) Accounting classification
Net decrease $

NOTE: If there are changes to multiple accounting classifications that cannot be placed in block 12, insert an asterisk and the words "See continuation sheet."

(g) Item 13. Check the appropriate box to indicate the type of modification. Insert in the corresponding blank the authority under which the modification is issued. Check whether or not contractor must sign this document. (See FAR 43.103.)

(h) Item 14 (Description of Amendment/Modification).

(1) Organize amendments or modifications under the appropriate Uniform Contract Format (UCF) section headings from the applicable solicitation or contract. The UCF table of contents, however, shall not be set forth in this document.

(2) Indicate the impact of the modification on the overall total contract price by inserting one of the following entries:

(i) *Total contract price increased by* $ .....

(ii) Total contract price decreased by $ .....

(iii) Total contract price unchanged.

(3) State reason for modification.

(4) When removing, reinstating, or adding funds, identify the contract items and accounting classifications.

(5) When the SF 30 is used to reflect a determination by the contracting officer of the amount due in settlement of a contract terminated for the convenience of the Government, the entry in Item 14 of the modification may be limited to —

(i) A reference to the letter determination, and

(ii) A statement of the net amount determined to be due in settlement of the contract.

(6) Include subject matter or short title of solicitation/contract where feasible.

(i) Item 16B. The contracting officer's signature is not required on supplemental agreements.

1. Revise Section C - Description/Specifications (Page 2 of 29) of the solicitation as follows:

Delete: Clause C1.1

Insert: C1.1 ITEM NO. 0001

Aluminum oxide abrasive shall conform to Military Specification, Abrasive Materials, For Blasting, MIL-A-21380B dated 15 July 1965 with the following exception:

1. Grade of mesh size shall be 20-26

2. Aluminum oxide abrasive shall not be reclaimed prior to sale to the Government, rather shall be virgin abrasive.

Ordering Data

(a) Military Specification, Abrasive Materials, For Blasting: MIL-A-21380B, 15 July 1965

(b) Type I, Grade - Mesh size 20-26

(c) 900 bags

(d) 50-lb. capacity, multi-wall paper sacks

(e) Level A

APPENDIX B

DRAFT PROCESS INSTRUCTION

WIRE-SPRAYED ALUMINUM (WSA) FOR CORROSION PROTECTION: NAVSEA CC SYSTEMS 1 AND 2

No.: _____

Effective: _____

Cancels: _____

D R A F T

PROCESS INSTRUCTION

Shore Intermediate Maintenance Activity

San Francisco

TITLE: WIRE-SPRAYED ALUMINUM (WSA) FOR CORROSION PROTECTION; NAVSEA CORROSION-CONTROL (CC) SYSTEMS 1 AND 2

SECTION:

I	EQUIPMENT	V	OPERATOR TRAINING AND CERTIFICATION
II	MATERIAL		
III	SAFETY	VI	METHOD
IV	QUALITY CONTROL	VII	FEEDBACK

ORIGINATOR:

APPLICABLE SHIP TYPES: ALL

REASON FOR REVISION:

APPROVALS:

DATE

ORIGINATOR: _____

PLANNING: _____

REPAIR OFFICER: _____

PRODUCTION: _____

SAFETY: _____

QUALITY ASSURANCE: _____

ENGINEERING: _____

REVIEW: ANNUALLY OR WHENEVER DOD-STD-2138(SH) IS CHANGED.

LEAD SHOP: [illegible] CONTROL SHOP 71A

SCOPE: The scope of this process instruction covers the required equipment, safety, quality control, personnel training/certification and application process (method) for applying wire-sprayed aluminum coatings (NAVSEA Corrosion Control (CC) Systems 1 and 2, for high-temperature or low-temperature service, respectively). This includes the application of the required paint coatings (NAVSEA CC System 3). Procedures are in accordance with DoD-STD-2138(SH) (Ref. A) to follow the guideline set forth in the NAVSEA Ship Class Corrosion Control Manuals (Ref. B).

REFERENCES:

A. DoD-STD-2138(SH), Metal-Sprayed Coating Systems for Corrosion Protection Aboard Naval Ships, 23 November 1981.

B. NAVSEA Corrosion-Control Manuals for Ship Classes AO-177, CG-16, DD-963, FF-1052, FFG-7, LHA-1, LPD-4, LPH-2 and LST-1179.

C. Federal Occupational Safety and Health Administration (OSHA) Standards and Regulations, (29 CFR 1910) Revision 11 March 1983.

D. NAVSEA S9086-VD-STM-000/CH-631, Preservation of Ships in Service (Surface Preparation and Painting), April 1981.

E. National Fire Protection Association (NFPA) Standard 33, Spray Application Using Flammable and Combustible Materials, 1985.

F. CC-Shop Technician Training Curriculum in the SQIP Format, ISA(WC)-110, April 1986.

G. NAVSEA 0655-AA-JPA-010, Job Performance Aid for Metal Sprayed Coating Systems.

H. Naval Reserve IMA-7 Training Program, Corrosion Control Using Wire Sprayed Aluminum.

I. METCO, Type 10E Flame Spray Gun Instruction Manual.

J. MOGUL, TJ-5 Instruction Manual.

SECTION I

EQUIPMENT

1.1 EQUIPMENT LIST

The following list gives the process sequence, generic equipment description and manufacturer for the equipment associated with the WSA process for SIMA San Francisco.

PROCESS SEQUENCE	EQUIPMENT DESCRIPTION
Precleaning	Vapor Degreaser
Rough-Blasting	Rough-Blasting Booth (10' x 15' x 15')
Rough-Blasting and Anchor-Tooth Blasting	Testing Sieve, 16-36 mesh
Anchor-Tooth Blasting	Anchor-Tooth Blasting Booth (10' x 10' x 20')
Anchor-Tooth Blasting	Dial Micrometer
Wire-Spray	Waterwash Spray Booth (8' x 6' x 12')
Wire-Spray Wire-Spray and Paint-Spray	Flame Wire-Spray Gun Systems (gun, manifold, wire spool) Dry Film Thickness Gages
Paint-Spray	Waterwash Spray Booth (8' x 6' x 20')
Paint-Spray	Paint-Spray Guns

B-3

SECTION II

MATERIAL

2.1 ALUMINUM WIRE

Aluminum wire used for CC Systems 1 and 2 shall conform to the requirements set forth in MIL-W-6712. The wire shall be coated by the manufacturer with special lubricants to aid in wire feed and minimize nozzle wear. The lubricants must not foul the recipient surface nor the sprayed aluminum matrix, leading to corrosion or loss of adhesion. The wire shall be stored and handled carefully and uncoil readily and be free of bends, kinks or burrs that would prevent its passage through the spray gun.

2.2 GASES

Gases used for thermal spraying aluminum wire shall conform to:

GAS	SPECIFICATION
Oxygen	BB-0-925
Acetylene	BB-A-106

2.3 ABRASIVE BLASTING MEDIA

2.3.1 Rough Blasting

Crushed garnet abrasive blasting media with a standard 16-mesh size shall be used to clean painted and corroded metallic surfaces.

2.3.2 Anchor-Tooth Blasting

Aluminum oxide abrasive blasting media with a standard 16- 36-mesh size shall be used to provide anchor-tooth surface profile of 2-3 mils, when measured with profile tape (Testex or equivalent) during final surface preparation of the substrate.

2.3.3 Restrictions

(a) Abrasive particles shall be clean, dry, sharp and free of rust and excessive fines.

(b) Abrasive particles shall not contain any feldspar or other mineral constituents that tend to break down and remain on the surface. Abrasive particles that have been used for cleaning contaminated surfaces shall not be used for final surface preparation, even if the abrasive has been screened.

(c) Abrasive blasting pots and hoses must be clean and uncontaminated. It is advisable to "dedicate" blasting pots and hoses to the anchor-tooth blasting operation.

(d) Prior to use, the crushed garnet and aluminum oxide grit shall pass the following oil contamination test:

(1) Fill a clean 5-ounce vial or bottle half full of abrasive particles.

(2) Fill the remainder of the vial or bottle with clean water.

(3) Cap and shake the vial or bottle.

(4) Inspect water for oil sheen.

(5) If any oil is observed, the abrasive particles shall not be used.

This test must be repeated for each reuse of anchor-tooth blasting media.

2.4 PROCESS AIR

Air compressors utilized in the abrasive blasting and thermal spray process shall furnish air which is free of oil and moisture. The air supply shall be adequate to maintain a minimum pressure of 75 lbs per square inch at the blast nozzle. The air shall conform to the requirements of BB-A-1034, with a maximum hydrocarbon content of 0.005mg/liter. Total maximum water content shall be 0.3mg/liter at 20°F.

2.5 MASKING MATERIALS

Any masking material that provides adequate protection of the substrate through both the abrasive blasting and thermal spraying operations without causing substrate corrosion or contamination may be used. Acceptable masking materials include various tapes, plastic caps or plugs, hose sections and wood or metal inserts.

The masking tapes used are:

(a) 1/2" green duct tape, NSN 8315-00-890-9872.

(b) 2" green duct tape, NSN 8315-00-074-5100.

(c) Hi-temp Al foil tape (0.007" thick, 3/4" wide x 36 yd. per roll, Stock No. 06004), T&F Division of SHR Industries, 3660 Edison, Rolling Meadows, Illinois 6008, (312) 392-8090.

2.6 CLEANING SOLVENTS

Toluene conforming to TT-T-548 and trichloroethane conforming to O-T-620C are approved cleaning solvents.

WARNING:

Toluene is flammable. Both toluene and trichloroethane are toxic. Use only in well-ventilated spaces. Do not use near open flames, blasting, thermal spraying work, or sources of sparks. Do not allow prolonged contact with bare skin. Read and follow precautions on container shipping labels before using contents.

2.7 PAINT

2.7.1 CC System 1, High-Temperature Service

Paint applied to items in service above 175°F shall conform to DoD-P-24555, "Paint, Aluminum, Heat Resisting (650°C)."

2.7.2 CC System 2, Low-Temperature Service

Paint applied to items in service below 175°F shall conform to the following:

2.7.2.1 Sealer and Barrier Coats

MIL-P-24441, "Paint, Epoxy-Polyamide, General Specification for, Type II", shall be utilized for sealing the wire sprayed aluminum and providing barrier protection. The paints shall be available in primer green (Formula 150) and haze gray (Formula 151).

2.7.2.2 Topcoats

TT-E-490, "Enamel, Silicone Alkyd Copolymer, Semigloss", shall be used for haze gray topcoats.

TT-E-489, "Enamel, Alkyd", shall be used for white, red, yellow and black topcoats.

DoD-E-699, "Deck Enamel, Formula 20", shall be used for deck gray topcoats on horizontal surfaces.

2.7.2.3 Thinner

TT-E-781, "Ethylene Glycol Monoethyl Ether, Technical (EGM)"; or a 50%/50% mixture of butyl alcohol (TT-B-846) and super high flash naptha (MIL-N-15178), shall be utilized to thin the MIL-P-24441 epoxy paints.

2.8 QUALITY CONTROL

A dial micrometer is used to measure the anchor-tooth surface profile off of the Press-O-Film tape (or equivalent) that had been applied to the surface. The Press-O-Film shall be extra course and may be ordered from Testex, Inc., P. O. Box 867, Newark, Delaware 19711.

SECTION III

SAFETY

3.1 GENERAL

The primary responsibility for safety rests with the individual, non-supervisory personnel who have been assigned to perform the work. The individual's skill level and knowledge of potential hazards is the first guard against unsafe conditions.

The operator's responsibility for safety is shared by his supervisor and all higher levels of management who must ensure that the operator has had the requisite training, is provided sufficient guidance and direction and maintains the required proficiency. In addition, periodic monitoring of all safety requirements should be made to assure they conform to the applicable Federal Occupational Safety and Health Administration (OSHA) Standards and Regulations, (29 CFR 1910) (Ref. C). Particular attention should be paid to Sections 1910.94, 1910.95, 1910.106 and 1910.107. Detailed safety information is given in DoD-STD-2138(SH), NAVSEA S9086-VD-STM-000, Chapter 631 (Ref. D) and National Fire Protection Association (NFPA) Standard 33 (Ref. E).

3.2 PRECLEANING SOLUTIONS AND SOLVENTS AND THINNING SOLVENTS

When naval personnel use alkaline cleaners or solvents for precleaning, and solvents for thinning, all applicable sections of *NSTM, Chapter* 631, Section 2, and the applicable NAVOSH Manual apply. All applicable OSHA rules and regulations and manufacturer's safety instructions shall apply to other industrial activities. Follow all safety precautions given on the shipping containers.

3.2.1 Respiration

Avoid inhalation of all solvent fumes by the use of proper ventilation and charcoal filter respirators.

3.2.2 Skin and Eyes

Avoid all solvent and cleaning solution contact with skin. Wear gloves which are impervious to the liquids as well as safety goggles.

3.3 ABRASIVE BLASTING OPERATIONS

When performing abrasive blasting, the current NAVOSH Manual and Sections 631-2.272 through 631-2.288 apply. Never point a blast nozzle at any part of any human body.

3.3.1 Flammable Residues or Fumes

Prior to any abrasive blasting, items previously containing flammable materials shall be purged of dangerous concentrations and certified safe by a Gas-Free Engineer .

3.3.2 Grounding

Blast hose shall be grounded to dissipate static charges.

3.3.3 Protective Clothing

Face shields with dust hoods or helmets with forced-fed purified air shall be used to protect the eyes, face, chin and neck from airborne particles. Safety glasses or goggles shall be worn by all persons near any blasting operation.

3.4 COMPRESSED GASES

3.4.1 Compressed Air

Compressed air shall be used at pressures recommended by the equipment manufacturers. Compressed air shall not be used to clean clothing.

3.4.2 Compressed Oxygen and Acetylene

3.4.2.1 Daily Inspection

Inspect all gas equipment daily for leaks and loose connections.

3.4.2.2 Keep Gas Cylinders Safe

Consider all charged gas cylinders as potentially dangerous. Always secure the cylinders to keep them from toppling. When the cylinders are not in use, shut off gas. Keep cylinders away from heat. Any cylinders that are not installed on the manifold, must have their valve caps in place.

3.4.2.3 Ventilation

Before opening any of the gas valves, always provide adequate ventilation of the work area.

3.5 WIRE SPRAY PROCESS

3.5.1 Manufacturer's Recommendations

Wire spray guns shall be maintained according to the manufacturer's recommendations. At least one copy of each gun type's operating manual must be kept on file at the Shop.

3.5.2 Ignition

Do not ignite the gun without having the wire in the nozzle. If ignited without the wire, a flame may flashback and damage the gun and injure the operator. Do not use matches for ignition. Use only a friction lighter, pilot light or arc igniter.

3.5.3 Personal Protection

3.5.3.1 Metallic Poisoning

Never permit metallic spray dust to enter the eyes, mouth, cuts, scratches or open wounds. After spraying, wash hands thoroughly.

3.5.3.2 Flame-Resistant Clothing

Flame-resistant clothing shall be used and leather or rubber gauntlets shall be worn. The clothing should be strapped tightly around ankles and wrists to prevent metallic dust contact.

3.5.3.3 Hearing Protection

Double hearing protection shall be worn by all operators and attendant personnel, unless otherwise specified by SIMA Safety Department after a decibel level check.

3.5.3.4 Eye Protection

Goggles or face shields shall be worn for protection against dust and intense light from the wire spray operation. Flame wire spraying requires the use of light filter shades 2-4. Arc wire spraying requires shades 11-12.

3.5.3.5 Respiratory

Filter masks shall be worn by the wire spray gun operator during spraying operations. The spray booth must be in operation prior to gun ignition.

SECTION IV

QUALITY CONTROL

4.1 PRODUCTION QUALITY CONTROL RESPONSIBILITY

The following inspection procedures shall be followed by the Shop Quality Control Inspector (SQCI) for all wire sprayed aluminum work accomplished by the Corrosion Control Shop.

4.2 RECEIPT INSPECTION - A receipt inspection shall be accomplished as follows:

(a) Conduct a visual inspection to determine if welding, structural repairs, degalvanizing, removal of prior WSA coatings or further disassembly is required. If repairs are required, notify shop supervisor so item can be routed to applicable shop. If further disassembly is required, advise shop supervisor that further disassembly is required before shop acceptance.

(b) Inspect Ship-to-Shop Tag (Enclosure 1) attached to the item for completeness and give Part 3 to the ship's representative.

(c) Utilize a Production Control Record (Enclosure 2) for each lot of similar items on the SIMA Job Order. Assign a Production Control Number from the *Production Control Work Log. Enter this number in the serial number block of the* Ship-to-Shop Tag. The Production Control Number will consist of:

- The letter designation of the IMA.
- A sequential four-digit number beginning with 0001.

Example: For an item that was coated at SIMA, San Francisco, a typical production control number would be S-0001.

(d) Attach a metal tag with the Production Control Number stamped on it. After the metal tag is attached, remove the Ship-to-Shop Tag and staple it to the Production Control Record. Release item for precleaning.

(e) Degreasing shall be conducted according to Section 6.2.1. Visually inspect the items to assure that they are free from oil or grease. Release item for masking.

4.3 MASKING INSPECTION - A masking inspection shall be conducted as follows:

(a) Ensure that only high-temperature flame-resistant masking materials and plugs are used.

(b) Visually inspect items to ensure that all areas not to be coated ("fit and function" surfaces and openings) are either masked off or plugged. Ensure masking is tightly adherent to the substrate and to itself when applied in multiple layers. Refer to Section 6.3 for proper masking of dissimilar metal contact areas. Release items for strip blasting.

4.4 STRIP-BLASTING INSPECTION - A strip-blast inspection will be conducted after strip blasting as follows:

(a) Ensure that all scale, rust and paint has been removed.

(b) Ensure that all masked areas are still intact. Remask as required.

(c) Inspect for warpage, cracks, bad welds or over blast. Take corrective action as necessary to correct any discrepancies.

(d) Take random grit-mesh-size measurements prior to the first daily production run and at the end of the daily production run. Additional measurements may be necessary during the day to assure that the grit is 16-36 mesh in size.

4.5 ANCHOR-TOOTH-BLAST INSPECTION - An anchor-tooth-blast inspection will be conducted after anchor-tooth blasting as follows:

(a) Visually inspect and ensure that all masked areas are still intact. Remask as required.

(b) Visually inspect and ensure that all areas of each component in the lot are uniformly blasted to white metal (SSPC-5). Ensure that anchor-tooth-blasted components are handled with clean cloth gloves and rags.

(c) Measure the anchor-tooth profile at a random location on a minimum of one randomly-selected component from the lot. Use Press-O-Film (x-coarse) and a calibrated dial micrometer thickness gage (MITUTOYD #7326 or equivalent).

(d) Ensure that anchor-tooth profile is 2 to 3 mils.

(e) Enter the profile measurement, date and time on the Production Control Record, and initial the Press-O-Film Tab and attach the tab to Production Control Record.

(f) Sign Production Control Record in Section 4 for the Anchor-Tooth Blast Inspection.

(g) Ensure that the equipment operators are noting the date and time of their process sequence completion on the Production Control Record.

(h) Release components to the wire spray work station, ensuring that coating operation is started within four hours after anchor tooth surface preparation. If more than 15 minutes is expected to lapse between the surface preparation and the start of the wire spray process, the prepared anchor-tooth surface shall be protected from moisture, contamination and fingermarks. Wrapping with clean paper will normally provide adequate protection.

4.6 WIRE-SPRAY INSPECTION

4.6.1 Pre-Wire-Spray Process Checks

(a) Permit wire spraying only when the temperature of the steel surface to receive the WSA is greater than the 10°F (5°C) above the dew point. Dew points shall be taken by the WSA operators at the beginning of each shift and recorded in the CC Shop Dew Point Log. The check should be repeated if any significant change in weather occurs (i.e., rain begins). The SQCI should ensure that the log is being kept properly.

(b) Daily, the SQCI shall check the Bend Test Log kept by the WSA operators and that day's test coupons, to ensure that the required process tests were done before starting WSA production.

4.6.2 Post-Wire-Spray Inspection

(a) Ensure that the wire-spray process was started within four hours and completed within six hours after the anchor-tooth surface preparation.

(b) Visually inspect the surface, ensuring that the coating is free of blisters, chips and cracks.

(c) Calibrate the thickness gage (magnetic flux type) before the first measurements in the morning and afternoon, and at random times during the day. The calibration can change due to temperature and handling.

(d) Measure the coating thickness on each item in the lot. Thickness measurements will be taken in at least five random locations, including areas where the item's geometry changes, such as angles and flanges. Wire-spray coating thicknesses shall be:

- 10-15 mils for high-temperature service (NAVSEA CC System 1).
- 7-10 mils for low-temperature service (NAVSEA CC System 2).

Note: Components with coating thicknesses below specifications shall receive additional WSA coats. Components with coating thicknesses above 20 mils shall be reblasted to white metal and recoated.

(e) Sign Section 6, WSA Thickness Check, of the Production Control Record. Release item to paint spraying work station.

4.7 SEALER, BARRIER AND TOPCOAT INSPECTION

An inspection of the sealer, barrier and topcoats will be conducted as follows:

4.7.1 High-Temperature Applications (NAVSEA CC System 1)

4.7.1.1 First Coat

Ensure that no more than four hours has elapsed between the wire-spray application and the application of the first coat (sealer coat) of the heat-resistant aluminum paint (DoD-P-24555). **Note: If more than four hours has elapsed since wire spraying, then it is necessary to remove and reapply the WSA.**

4.7.1.2 Second Coat

Ensure that at least eight hours has elapsed since the application of the sealer coat before the second coat of paint is applied.

4.7.2 Low-Temperature Applications (NAVSEA CC System 2)

4.7.2.1 First Coat

Ensure that no more than four hours has elapsed between the wire-spray application and the application of the first coat (sealer coat). The first coat is Formula 150 (green primer) thinned by 50% (volume) with added solvent (EGM). **Note: If more than four hours has elapsed since wire spraying, then it is necessary to remove and reapply the WSA.**

4.7.2.2 Second Coat

Ensure that at least eight hours but not more than 72 hours has elapsed between the application of the sealer coat and the second coat. The second coat is a barrier coating of full strength Formula 150 (green primer).

4.7.2.3 Third Coat

Ensure that at least eight hours but not more than 72 hours has elapsed between the application of the third coat and the second coat. The third coat is a barrier coating of full strength Formula 151 (gray).

4.7.2.4 Fourth Coat

Ensure that a minimum of 24 hours elapsed between the application of the third and fourth coats. The fourth coat is a topcoat of alkyd paint (TT-E-489 or TT-E-490) for vertical components or Formula 20 for horizontal components.

4.7.2.5 Fifth Coat

Ensure that a minimum of 24 hours elapsed between the application of the fifth and fourth coats. The fifth coat is of the same paint formulation as the fourth coat.

4.8 FINAL COATING THICKNESS INSPECTION ON ALL SIMILAR ITEMS IN JOB ORDER

(a) Ensure that a minimum of 24 hours has elapsed since the application of the final topcoat.

(b) Visually inspect the surface of each item, ensuring it is free of holidays, cracks or runs. Under no circumstances should any green primer be visible.

(c) Measure the total coating thickness (with a magnetic type thickness gage) on each item in the Job Order, ensuring that the required coating thickness was attained. Total coating thicknesses must be:

- 16-18 mils for high-temperature service (NAVSEA CC System 1).
- 17-20 mils for low-temperature service (NAVSEA CC System 2).

If any items do not meet the coating total thickness requirements, but previously met the WSA thickness requirements, then more topcoat paint must be applied.

(e) When all items in the Job Order have the required coating thicknesses, sign Section 14 of the Production Control Record.

(f) Release items to final assembly and packaging area.

4.9 FINAL ASSEMBLY INSPECTION

A final assembly inspection will be conducted as follows:

(a) Ensure that all masking and plugging material is removed.

(b) Ensure that, if required, installation kit and instructions are complete and are attached.

(c) Ensure that item is properly protected and stowed in such a manner as to protect all coated surfaces during transport.

4.10 ABRASIVE BLAST MEDIA INSPECTION

The SQCI shall be responsible for the inspection of all new and used abrasive blast media for both the rough blasting and anchor-tooth blasting operations. The actual inspection may be performed by another assigned CC Shop Technician, but daily reports must be provided to the SQCI.

(a) All new shipments of crushed garnet (16 mesh) and aluminum oxide (16-36 mesh) must be sampled and tested to assure that they comply with restrictions "A" and "D" of Section 2.3.3.

(b) The crushed garnet utilized in the rough blaster shall be checked at each cycle through the pressure pot for excessive fines by using a 36 mesh screen on the sample. If excessive fines exist (50% by volume), than the media must be replaced.

(c) The aluminum oxide utilized in the anchor-tooth blaster shall be checked at each cycle through the pressure pot for excessive fines by using a 36-mesh screen and tested for oil contamination according to part "D" of Section 2.3.3.

SECTION V

OPERATOR TRAINING AND CERTIFICATION

5.1 TRAINING

SIMA CC Shop personnel shall be trained and certified for applying the WSA CC Systems 1 and 2. Course completion and certification requires passing written examination and applying the WSA coating to test panels and test shapes in accordance with DoD-STD-2138.

The major training source documents are:

- DoD-STD-2138(SH) (Ref. A);
- NAVSEA 0655-AA-JPA-010, Job Performance Aid for Metal Sprayed Coating Systems (Ref. G);
- Naval Reserve IMA-7 Training Program, Corrosion Control Using Wire-Sprayed Aluminum (Ref. H);
- Equipment Manufacture Operator and Field/Factory Maintenance Instructions; and
- This Process Instruction.

5.2 CERTIFICATION OF OPERATORS

Section 5.4 of DoD-STD-2138(SH) (Ref. A) applies; the applicable information is summarized below:

- **Certification Test Requirements**

  (Test Panels: Four 2" x 3" x 0.050" wire sprayed 7-10 mils thick.)

  (1) **Visual Examination**

  (a) Inspect for uniform appearance and complete absence of:

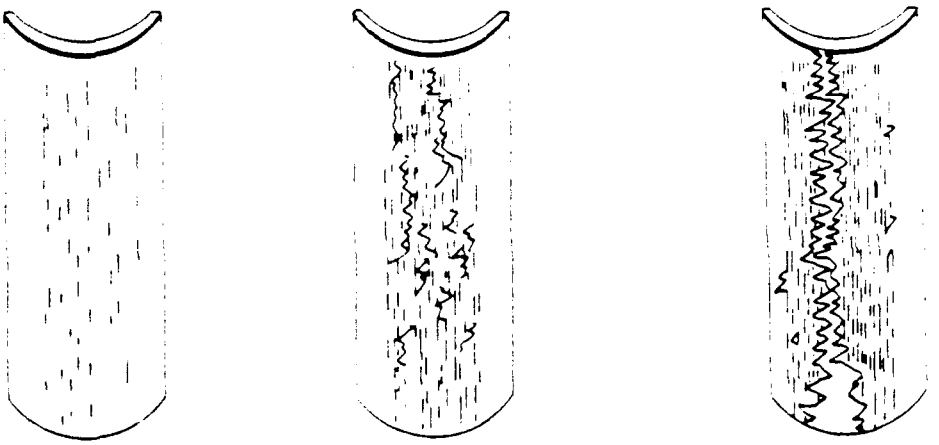
  - blisters,
  - cracks,
  - chips or loosely-adhering particles,
  - oil or other internal contaminants, and
  - pits exposing the undercoat or substrate.

  b. Ensure aluminum modules do not exceed 0.045" diameter by 0.025" high.

(2) **Bend Test**

- Bend sprayed panels 180° on a 1/2" diameter rod with WSA coating on the outer radius.

- Visually examine for no disbonding, delamination or gross cracking of the coating due to bending. Small hairline cracks or alligatoring of the coating in the vicinity of the bend are permissible. Acceptable and non-acceptable bend test results are illustrated below:



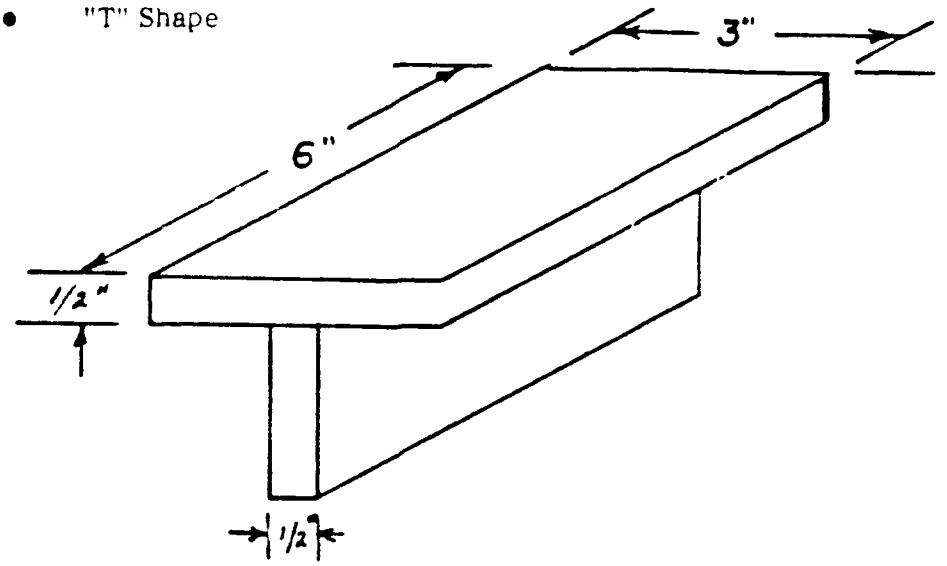
IDEAL (Smooth) **MARGINAL (Cracks)** **REJECT (Disbonding)**

(3) **Bond Test**

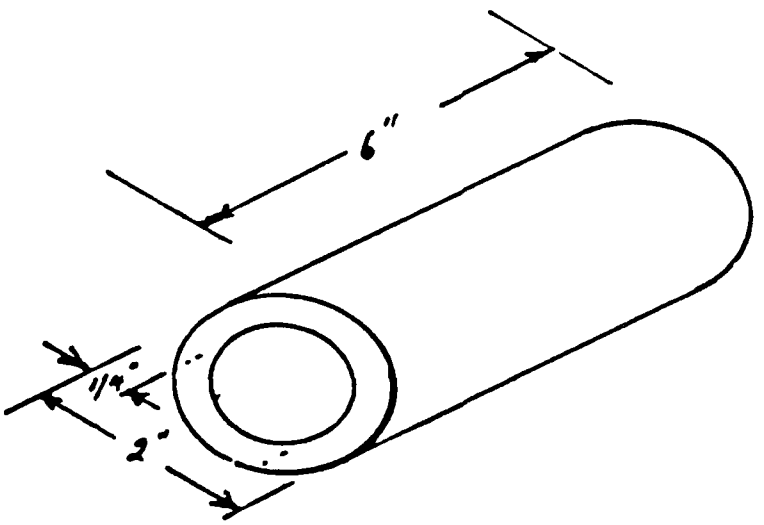
- Conduct a bond test of five 1" diameter x 1" long steel fixtures in accordance with ASTM C633. The average bond strength must be greater than 2000 psi, with no bond strength less than 1500 psi.

(4) **Shape Test**

- "T" Shape



- "Pipe" Shape



- The "T" and "pipe" shapes must be coated with 7-10 mils WSA and pass the coating thickness and visual examination.

SECTION VI

METHOD

6.1 SHIP EQUIPMENT/COMPONENTS RECEIPT

Acceptance by the CC Shop of ship equipments/components for processing shall be accomplished by the Shop Petty Officer assigned to tracking the production status of work accomplished by the Shop and work in conjunction with the SQCI. Refer to Section 4 for responsibilities of the SQCI during product receipt. Initiate a Production Control Record for each SIMA Job Order.

6.1.1 Receipt Requirements

(a) Only ship items which are noted in the SIMA Job Order shall be accepted.

(b) Only items which have been properly disassembled to their smallest removable components shall be accepted.

(c) Components which arrive damaged will not be accepted and must be rerouted by the ship for repair or replacement.

6.2 PRECLEANING

Prior to any masking, blasting or spraying, surfaces shall undergo the following:

6.2.1 Degreasing

Surfaces that have come in contact with oil or grease shall be solvent cleaned. Solvents shall be in accordance with Section 2.6. Cleaning should be accomplished by vapor degreasing, but may also be performed by wiping and brushing.

6.2.2 Additional Cleaning

After solvent cleaning, if surfaces still have deposits that may cause disruptive contamination of the blasting grit, they may be cleaned with trisodium phosphate solution, rinsed with clear, potable water and dried.

6.2.3 Preliminary Determination of Possible Heat Cleaning, Degalvanizing or Dealuminizing Requirements

The items should be checked to determine if any additional surface preparation will be required before abrasive rough blasting.

6.2.3.1 Heat Cleaning - Porous materials that were heavily soaked in oils or greases require heat cleaning.

6.2.3.2 **Demetallizing** - Metals that have been coated with zinc or aluminum during manufacture must be demetallized in a facility with a caustic dip tank. Determine if any aluminum or zinc coatings are present on the component by scraping off paint (with a knife) down to bare metal. Then use a calibrated coating thickness gage (magnetic type) to determine if there is a layer of nonmagnetic coating (i.e., zinc or aluminum) present. The gage should indicate near zero if no metal coating exists.

6.3 MASKING

6.3.1 General

(a) Refer to Section 2.5 for proper masking material.

(b) Mask all areas which may be adversely affected by abrasive blasting or metal spraying.

(c) Tightly apply two layers of tape with the second layer at right angles to the first.

(d) When masking around dissimilar metals, such as brass wedges or bushings on steel components, apply the masking tape so that the WSA will be applied 1/4-inch onto the periphery of the dissimilar metal.

(e) Inspect masking for damage between the abrasive blasting and metal spray process and replaced if damaged.

6.3.2 Required Masking

The following surfaces shall be properly masked or plugged:

(a) Machined surfaces that are required to move with respect to each other, such as threads, bearing contacts, gear teeth and slides.

(b) Surfaces related to component alignment, proper seating and mountings, such as flange faces, counterbores and keyways.

(c) Electrical assemblies, such as contacts, relays and insulators.

6.4 STRIP BLASTING

Items shall be strip blasted to remove all old paint and corrosion products.

(a) Utilize 16-mesh abrasive grit. Refer to Section 2.3.1 for strip blasting material.

(b) Exercise care when abrasively blasting thin gage metals to prevent product warping or any other damage.

(c) Remain alert for any warpage, cracks, bad welds or excessive metal removal. Any items exhibiting this type of damage shall receive the necessary repairs before continuing further in the process. Minor repairs shall be accomplished by the CC Shop or by the applicable Repair Shop, utilizing a "hard card". Major repairs require contacting the SIMA Planner to obtain a Job Order Supplement for repair work by the applicable Shop.

(d) Refer to Section 4.4 to assist the SQCI.

(e) After abrasive blasting, the items shall be cleaned of all grit and dust by using an air gun and lint-free rag.

6.5 HEAT CLEANING, DEGALVANIZING OR DEALUMINIZING WHEN NECESSARY

Components requiring heat cleaning for entrapped oils in porous surfaces or removal of previously failed metallic coatings may now be processed.

6.5.1 Heat Cleaning

(a) To remove oil and grease contamination from porous surfaces, the parts shall be heated in a vented electric oven for at least four hours.

(b) Only items being degreased may be in the oven at the same time.

(c) Steel alloys may be heated to 600°F. Aluminum alloys, except age-hardened alloys, may be heated to 300°F.

6.5.2 Demetallizing

The removal of metallic coatings is most easily accomplished through chemical baths, and is therefore recommended. The coatings can be removed by rough abrasive blasting, but this will more than double the manhour and material requirements of the operation.

6.5.2.1 Degalvanizing

Zinc coatings that have suffered appreciable failure must be removed in an acid dip tank through an authorized service activity.

6.5.2.2 Dealuminizing

Aluminum coatings that have suffered appreciable failure must be removed in a caustic dip tank through an authorized service activity.

6.6 ANCHOR-TOOTH ABRASIVE BLASTING

Anchor-tooth blasting is conducted to guarantee the presence of a surface profile for bonding of the coating and to clean the surface of contamination left by the rough blasting operation. Refer to Section 2.3.2 for material specification requirements.

(a) Items shall be anchor-tooth blasted to a "white metal" finish (SSPC-SP5). A white metal finish is defined as a surface with a gray-white, uniform metallic color, slightly roughened to form a suitable anchor pattern for coatings. When viewed with a 10X magnifying glass, the surface shall be free of oil, grease, dirt mil scale, corrosion products, paint or any other foreign matter.

(b) The abrasive blasting shall be accomplished using clean aluminum oxide grit (16-30 mesh) to ensure that the proper anchor tooth of 2-3 mils is provided. The anchor-tooth profile is measured using Press-O-Film (X-coarse) and a calibrated dial micrometer. The SQCI will be responsible for certifying that the items in the Job Order meet these requirements, by random sampling, but the operator must be familiar with the profile test and monitor his/her own work as well.

(c) Care must be exercised to prevent damaging thin-gage items. Anchor-tooth blasting should be conducted as a quick sweep of the surface, not as a metal removal procedure.

(d) After the item has been blasted, it shall be cleaned of all grit and dust by using an air gun and lint-free rags.

(e) The cleaned item shall be protected from moisture, contamination and fingermarks. Wrapping with clean paper will normally provide adequate protection. Handle the anchor-tooth blasted items with clean cloth gloves or rags.

(f) Anchor-tooth blast inspection shall be conducted as stated in paragraph 4.5.

(g) The wire spray process must be started within four hours after the anchor-tooth blast, or else the anchor-tooth blast will have to be repeated.

6.7 WIRE SPRAY APPLICATION

6.7.1 Wire Spray Gun Operation

Refer to the operating manuals for the METCO 10E and/or MOGUL TJ5 flame wire spray guns for the application of aluminum. The manuals provide the necessary gas flow rates and maintenance required.

6.7.2 Dew Point Check

Check the steel substrate's surface temperature to assure that no condensation will form due to the relative humidity of the ambient air. If the steel substrate temperature is not 10°F (5°C) above the dew point, no metal spraying shall be conducted.

6.7.3 Daily Sample Coupons

Prior to commencement and once during each day's or shift's production run, a sample coupon shall be prepared by the operator.

(a) Anchor-tooth blast a test coupon with the grit currently in use. The test coupon (3 x 2 x 0.05 inches) shall be sprayed on one of its large faces. The WSA shall be applied 7-10 mils if the production run is for low-temperature applications, or 10-15 mils if the production run is for high-temperature applications.

(b) The test coupon shall be visually examined and shall not contain any: blisters, cracks, chips or loosely-adhering particles, oil or internal contaminants, or pits exposing the substrate.

(c) The sprayed panel shall be bent approximately 180 degrees on 1/2-inch diameter rod. The coating shall be on the outside surface of the bend.

(d) No disbonding, delamination or gross cracking of the coating shall occur due to bending. Small hairline cracks or alligatoring of the coating in the vicinity of the bend are permissible. Figure 6-1 illustrates acceptable and nonacceptable bend test results.

(e) If the coupon fails the test, then the cause of failure must be found and fixed and the test repeated until a coupon passes. This may require checking: the gas cylinder pressures or for any acetone in the flow meters; the drains on the air filter; the anchor-tooth on the coupon; and the grit for breakdown or contamination.

6.7.4 Application of WSA to Ship Components

6.7.4.1 Time Requirement

The metal spray application shall be started within four hours after anchor-tooth surface preparation, and finished within six hours. Continue to note the date and time of the completion of each process sequence.

6.7.4.2 Application

(a) The aluminum coating shall be applied in multiple layers, and in no case shall less than two crossing passes (oriented at right angles to each other) be made over every part of the surface.

(b) The sprayed metal shall overlap by 50% on each pass of the gun to assure uniform coverage.

(c) The aluminum coating shall be applied to the required thicknesses of:

- 10-15 mils for high-temperature service (NAVSEA CC System 1).
- 7-10 mils for low-temperature service (NAVSEA CC System 2).

The operator shall make thickness checks during the process to ensure adequate thickness is provided. The operators should be responsible in not allowing any products with thin coats of WSA to pass further along in the process.

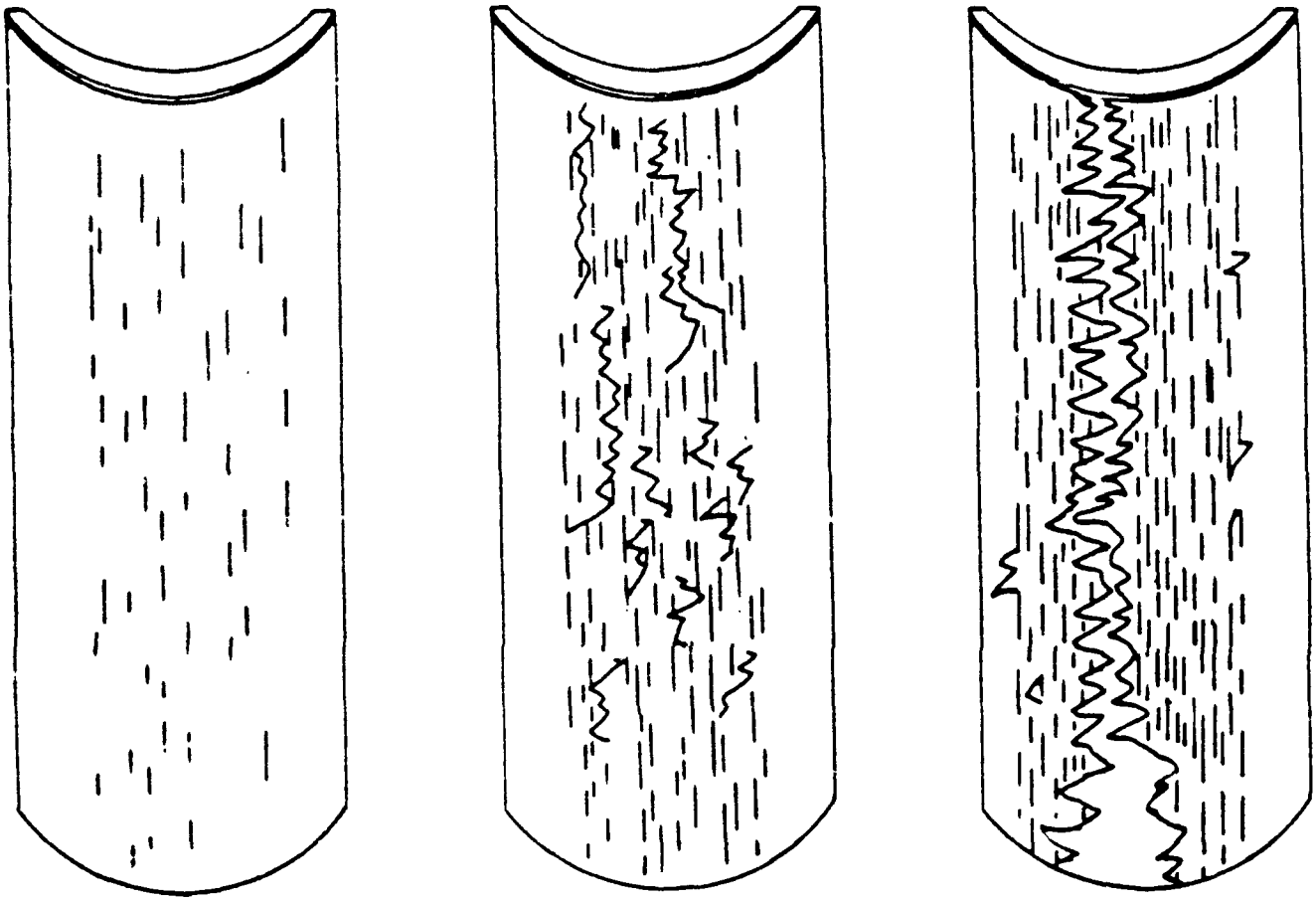


Figure 6-1 Coupon Bend Test Accept/Reject Examples

(d) The spray gun shall be held 5 to 8 inches from the surface being sprayed. The angle of the spray stream shall be as close to 90 degrees as possible, and never less than 45 degrees. Utilize gun accessories, such as angle nozzles, to maintain proper spray angles. The operator should study the recipient item before commencing spraying to determine the best plan to follow. Local masking may be necessary to prevent overspray from building up on complex shapes.

(e) Upon completion of spraying, contact the SQCI to certify proper coating thickness on the Production Control Record.

(f) Protect the freshly coated item from moisture, dirt and hand marks. Handle with clean gloves and rags.

(g) The WSA coating shall be sealed within four hours of WSA application to prevent the entrapment of moisture and corrosive salts from the marine atmosphere.

6.8 PAINT APPLICATION

When applying the various paints, the operators shall monitor the wet film thickness to aid in obtaining the specified dry film thickness (DFT). Using a wet film thickness gage, take measurements during each coat. The wet film thickness will be approximately twice as thick as the resultant DFT after drying. Refer to Section 2.7 for paint material specifications.

6.8.1 Application for High-Temperature Components (NAVSEA CC System 1)

Refer to Figure 6-2 for an illustration of this coating system.

6.8.1.1 First Coat (Sealer Coat)

(a) The first coat (sealer coat) shall be applied within four hours after the WSA application.

(b) The sealer paint is the heat-resistant aluminum paint meeting DoD-P-24555.

(c) Apply the paint to obtain a dry film thickness (DFT) of 1.5 mils. The wet film thickness will be approximately 3 mils.

6.8.1.2 Second Coat (Topcoat)

(a) Allow eight hours to pass before applying the second coat of heat-resistant aluminum paint.

(b) Apply another 1.5 mil DFT coat of paint, to obtain a total paint DFT of 3 mils.

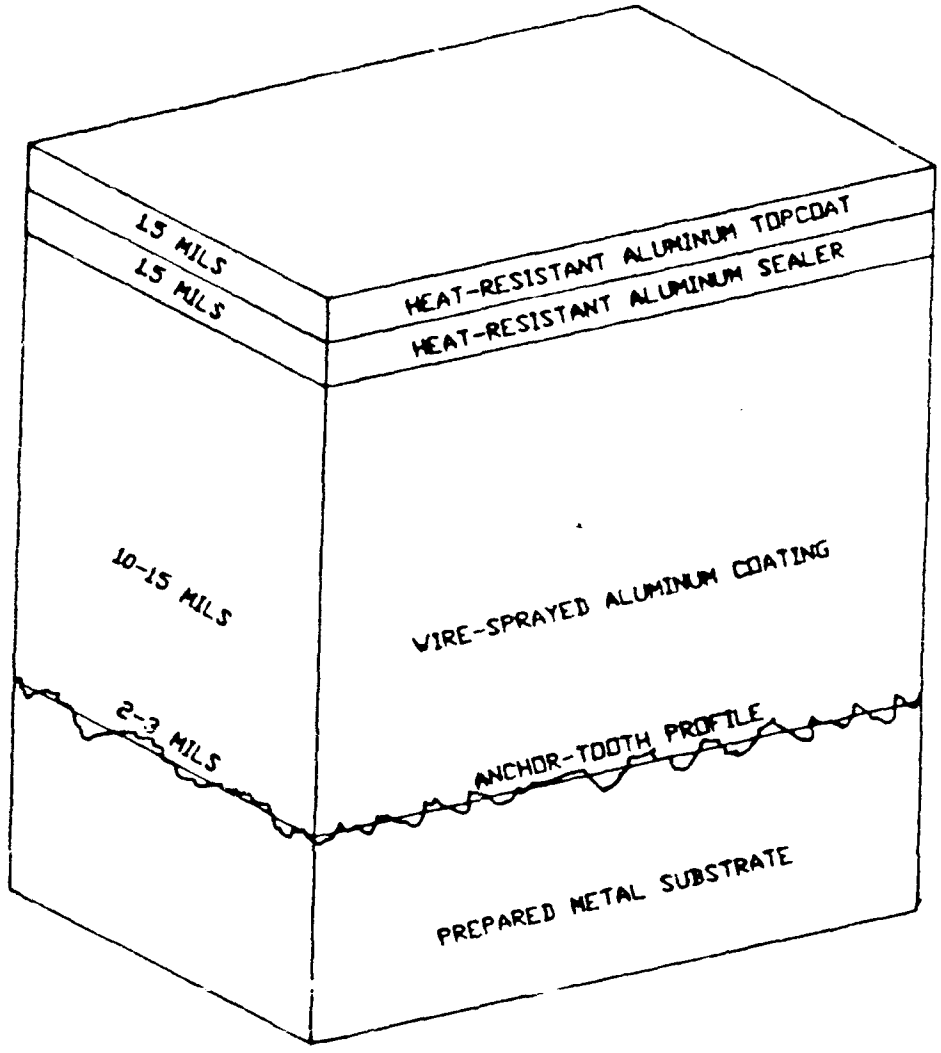


Figure 6-2 **NAVSEA CC System 1, WSA With Heat-Resistant Aluminum Paint**

6.8.2 Application for Low-Temperature Components (NAVSEA CC System 2)

Refer to Figure 6-3 for an illustration of this paint system.

6.8.2.1 First Coat (Sealer Coat)

(a) The first coat (sealer coat) shall be applied within four hours after the WSA application.

(b) The sealer paint is Formula 150 (green primer) thinned by 50% volume, with solvent. Thinning solvents shall be either EGM or another approved solvent.

(c) Apply to a DFT of 0.5 to 0.75 mils, i.e., requires a wet film thickness of 1-1.5 mil.

6.8.2.2 Second Coat (Barrier Coat)

(a) The second coat shall be applied at least eight hours but not more than 72 hours after the first coat was applied.

(b) Utilize full strength Formula 150 (green primer) as the second coat.

(c) Apply enough paint to obtain a 3-mil DFT (i.e., requires a wet film thickness of 6-mils).

(d) Some items, such as doors, hatches and scuttles, may have angle areas that cannot be coated by spray paint. Utilize a painter's 1-1.5" angle brush to coat these areas.

6.8.2.3 Third Coat (Barrier Coat)

(a) The third coat shall be applied at least eight hours but not more than 72 hours after the second coat was applied.

(b) Utilize full strength Formula 151 (gray) as the third coat.

(c) Apply enough paint to obtain a 3-mil DFT.

(d) When hard to spray angle areas are present, utilize a painter's 1-1.5" angle brush to coat these areas.

6.8.2.4 Fourth Coat (Topcoat)

(a) The fourth coat shall be applied after a minimum of 24 hours has elapsed since third coat was applied.

(b) Utilize alkyd paints (TT-E-489 or TT-E-490) meeting the color requirements for the particular ship component for vertical surfaces; and Formula 20 for horizontal surfaces.

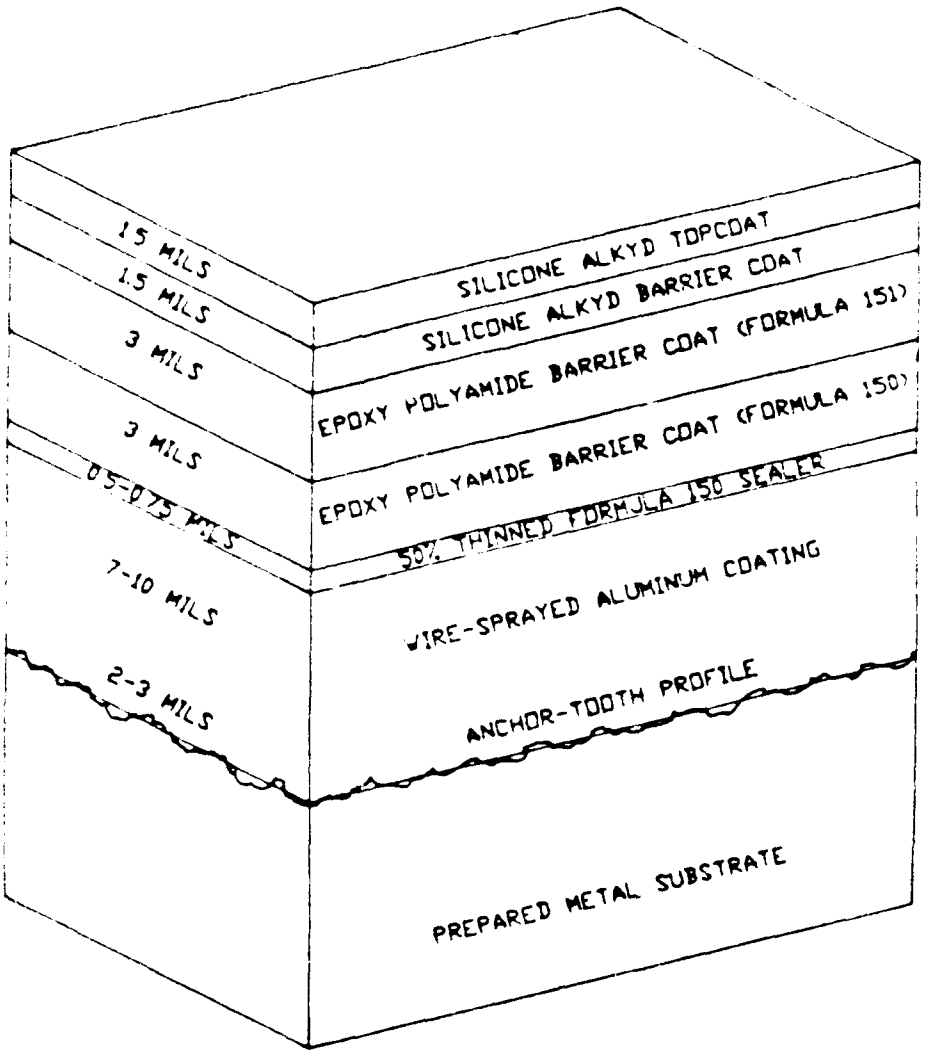


Figure 6-3 NAVSEA CC System 2, WSA With Five-Coat Paint System

(c) Apply enough paint to obtain a 1.5-mil DFT.

6.8.2.5 Fifth Coat (Topcoat)

(a) The fifth coat shall be applied after a minimum of 24 hours has elapsed since the fourth coat was applied.

(b) Utilize the same paint as before (TT-E-489, TT-E-490 or Formula 20) meeting the color requirements of the particular ship component.

(c) Apply enough paint to obtain a 1.5-mil DFT.

(d) Allow final coat to dry.

6.9 FINAL COATING THICKNESS INSPECTION

The SQCI officially performs this inspection, but the operators responsible for WSA and paint application should be aware of the results. The operators need to be familiar with any problem areas. Refer to Section 4.8 for inspection procedures. The total coating thicknesses must be:

- 13-18 mils for high-temperature service (NAVSEA CC System 1).
- 17-20 mils for low-temperature service (NAVSEA CC System 2).

6.10 FINAL ASSEMBLY

(a) Remove all masking and plugging material.

(b) Prepare the required installation kit (i.e., fasteners, anti-seize, sealant and instructions).

(c) Properly protect item for temporary stowage and transport to customer ship.

(d) The Shop Petty Officer in charge of production tracking and the SQCI shall agree to final product release.

(e) Remove and discard the metal identification tag and re-attach Ship-to-Shop Tag.

(f) Remove Part 2 of Ship-to-Shop Tag and notify Shop Supervisor that item is ready for pickup.

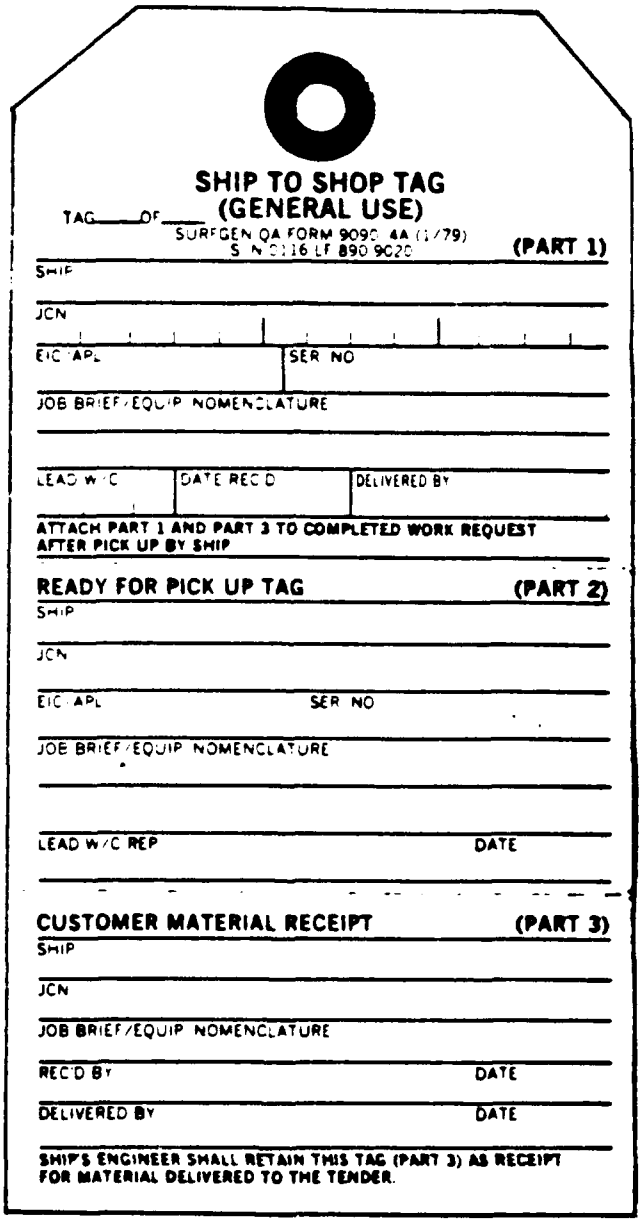
(g) When Ship's Force picks up item, complete and attach Parts 1 and 3 of Ship-to-Shop Tag to Production Control Record.

SECTION VII

FEEDBACK

In addition to the daily supervision of production and quality control, the following "feedback" indications will be used to monitor and maintain/improve the quality and productivity of the CC Shop:

- Verbal and written reports from customer ships and shops.
- Weekly analysis of the CC Shop's:
  - Production input to output;
  - Labor and materials consumed;
  - PM/CM activity;
  - QC activity and results;
  - Product degradation/failure reports; and
  - Operator training/certification.



SHIP TO SHOP TAG
(GENERAL USE)

TAG ____ OF ____

SURFGEN QA FORM 9090 4A (1/79)
S N 0116 LF 890 9020

(PART 1)

SHIP

JCN

EIC/APL | SER NO

JOB BRIEF/EQUIP NOMENCLATURE

LEAD W/C | DATE REC'D | DELIVERED BY

ATTACH PART 1 AND PART 3 TO COMPLETED WORK REQUEST AFTER PICK UP BY SHIP

READY FOR PICK UP TAG **(PART 2)**

SHIP

JCN

EIC/APL SER NO

JOB BRIEF/EQUIP NOMENCLATURE

LEAD W/C REP DATE

CUSTOMER MATERIAL RECEIPT **(PART 3)**

SHIP

JCN

JOB BRIEF/EQUIP NOMENCLATURE

REC'D BY DATE

DELIVERED BY DATE

SHIP'S ENGINEER SHALL RETAIN THIS TAG (PART 3) AS RECEIPT FOR MATERIAL DELIVERED TO THE TENDER.

Enclosure 1

CORROSION CONTROL SHOP
WIRE SPRAYED ALUMINUM
PRODUCTION CONTROL RECORD

USS _____
Ship

Hull Number

_____
Job Control Number (JCN)

_____
Production Control Number

_____
Item Description

_____
Location Deck Frame Side

TYPE COATING:

_____ WSA (HT) SYS 1

_____ WSA (LT) SYS 2

FINISH COLOR:

_____ Heat Res. Alum. Paint

_____ Haze Gray

_____ Deck Gray

_____ Other _____

SECTION		PROCESS SEQUENCE	DATE	TIME	SHOP QCI SIGNATURE
1.		Receipt, Degrease, Degalvanize or Dealuminize			
2.		Masking			
3.		Rough Abrasive Blast			
4.		Anchor-Tooth Abrasive Blast 2-3 mils			
5		Thermal Spray Operator Name_____			Attach *Profile Tape* Here
6.		WSA Thickness Check			
		SYS 1: 10-15 mils SYS 2: 7-10 mils			
		Seal, Barrier and Top Coat			
		Type/DFT Rgmt	DATE	TIME	
CC SYS 1	7.	Heat Res. Alum. Paint/1.5 mils			
	8.	Heat Res. Alum. Paint/1.5 mils			
CC SYS 2	9.	50% Formula 150/0.5-0.75 mils			
	10.	Formula 150/3 mils			
	11.	Formula 151/3 mils			
	12.	Alkyd Topcoat/1.5 mils			
	13.	Alkyd Topcoat/1.5 mils			
14.		Final Coating Thickness on all similar items in Work Order			
		SYS 1: 13-18 mils SYS 2: [illegible]			
15		Final Assembly and Packaging			

Enclosure 2

APPENDIX C

DRAFT PROCESS INSTRUCTION

POWDER COATINGS, ELECTROSTATICALLY APPLIED: NAVSEA CC SYSTEM 4

No.: _____

Effective: _____

Cancels: Original Issue

D R A F T

PROCESS INSTRUCTION

Shore Intermediate Maintenance Activity

San Francisco

TITLE: POWDER COATINGS, ELECTROSTATICALLY APPLIED: NAVSEA CORROSION-CONTROL (CC) SYSTEM 4

SECTION:

I	EQUIPMENT	V	OPERATOR TRAINING
II	MATERIAL	VI	METHOD
III	SAFETY	VII	FEEDBACK
IV	QUALITY CONTROL		

ORIGINATOR:

APPLICABLE SHIP TYPES: ALL

REASON FOR REVISION: ORIGINAL ISSUE

APPROVALS:

DATE

ORIGINATOR: _____

PLANNING: _____

REPAIR OFFICER: _____

PRODUCTION: _____

SAFETY: _____

QUALITY ASSURANCE: _____

ENGINEERING: _____

REVIEW: ANNUALLY

LEAD SHOP: CORROSION-CONTROL SHOP
SHOP 71A

SCOPE: The scope of this process instruction covers the required equipment, method or industrial process, safety and quality control required for applying the NAVSEA Corrosion-Control (CC) System 4 (Powder Coatings, Electrostatically Applied) (Ref. A) to ferrous and aluminum-alloy substrates in accordance with the powder manufacturer's recommendations.

REFERENCES:

A. NAVSEA Corrosion-Control Manual for AO-177, DD-963, FF-1052, FFG-7, CG-16, LHA-1, LST-1179, LPH-2 and LPD-4 Class.

B. NORDSON, Manufacturer of Electrostatic Powder Coating Equipment, Finishing Equipment Division, D-1 and D-1A Powder Spray Systems.

C. RANDSBURG-GEMA Electrostatic Powder Coating System, Type 701 and 702.

D. BAYCO Industries of Ca., Custom Curing Ovens.

E. American Society for Testing and Materials (ASTM) D-4060, Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.

F. ASTM-D-3359, Standard Methods for Measuring Adhesion by Tape Test.

G. ASTM-D-870, Standard Method of Water Immersion Test of Organic Coatings on Steel.

H. NAVSEA S9086-VD-STM-000/CH-631, Preservation of Ships in Service (Surface Preparation and Painting), 15 Apr 81.

I. ASTM D-3363, Standard Test Method for Film Hardness by Pencil Test.

J. ASTM-D-2794, Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

K. ASTM-B-117, Standard Method of Salt Spray (Fog) Testing.

L. Federal Occupational Safety and Health Administration (OSHA) Standards and Regulations, (29 CFR 1910) Rev. 11 March 1983.

M. National Fire Protection Association (NFPA) Standard 33, Spray Application Using Flammable and Combustible Materials, 1985.

N. NFPA Standard 70, National Electrical Code, 1984.

O. CC-Shop Technician Training Curriculum, in the SQIP Format, ISA(WC)-110, April 1986.

SECTION I

EQUIPMENT

1.1 GENERAL

The equipments specified in this Process Instruction are typical for application of powder coating systems electrostatically applied in an industrial activity. The equipments consists of an electrostatic spray gun, power supply, resin hoppers, (Refs. B and C); dry filter spray booth, resin recovery system (optional), conveyor system (optional) curing oven, (Ref. D); grit-blast booth, grit-blast nozzle and hoses, pressure pots, grit-recovery system (optional), air-purification system, air-dryer system and quality control and safety equipment. A typical equipment layout and production flow diagram is presented in Figure 1-1. A general list of equipment is given in Table 1-1.

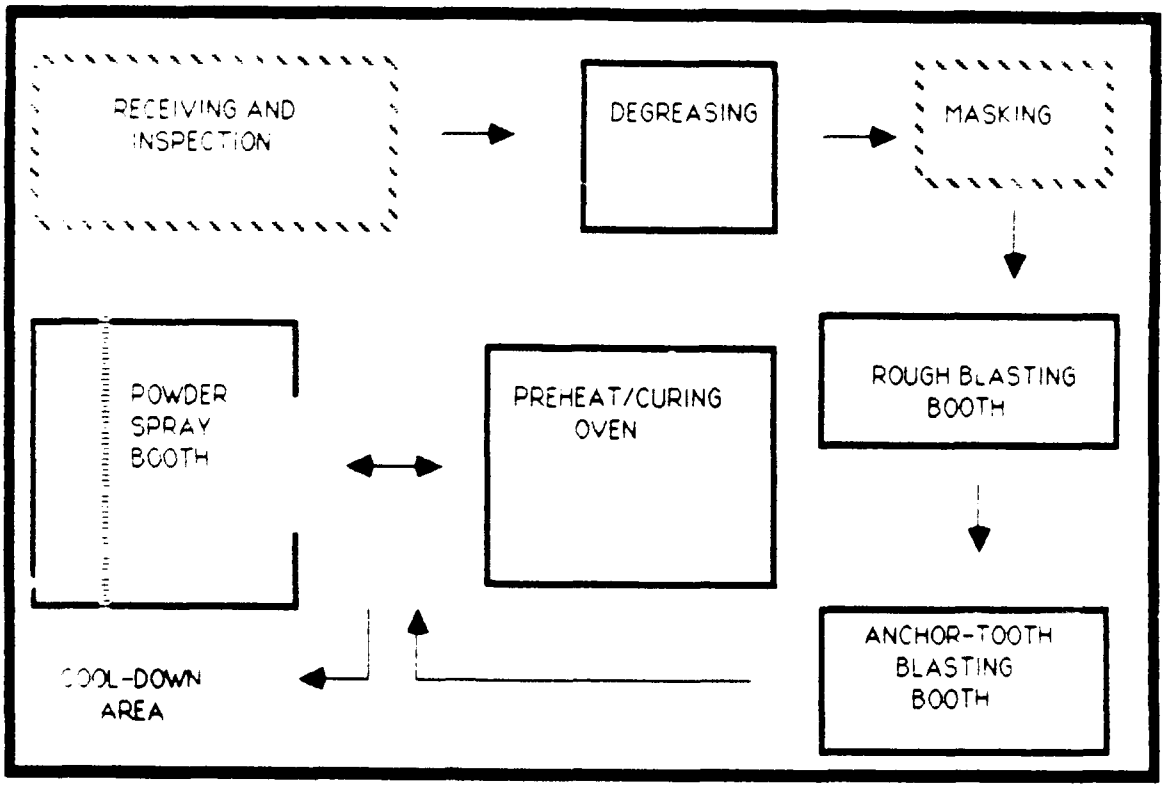


Figure 1-1 Powder Coating Station, Idealized Equipment Layout

Table 1-1 General List of Equipment

SURFACE PREPARATION EQUIPMENT

Degreaser, Vapor
Degreaser, Immersion (optional)
Rough Blaster (booth, pressure pots, cyclone, hoses and nozzles)
Anchor-Tooth Blaster (booth, pressure pots, cyclone, hoses and nozzles)
Dial Micrometer (for surface profile tape)
Testing Sieves (30, 60 and 80 mesh)

COATING EQUIPMENT

Electrostatic Spray Powder System (gun, hoppers and controls)
Spray Booth, dry filter
Preheating/Curing Oven
Curing Racks/Carts on Monorail
Suspension Hooks

QUALITY CONTROL EQUIPMENT

Coating Thickness Gage, magnetic flux type
Coating Thickness Gage, eddy current type
Impact Test Meter, Gardner type (optional)

MISCELLANEOUS EQUIPMENT

Work Tables
Razor Blades and Disposable Knives
Heat-Resistant Gloves and Sleeves
Dust Filter Masks
Leg Stats

SECTION II

MATERIAL

2.1 RESIN

2.1.1 Powdered Epoxy

The powdered epoxy shall consist of a finely divided powder that shall require no blending, mixing or addition of other compounds to effect a cure. The resin shall be thermosetting (oven cured) when applied in film thicknesses from 8 to 12 mils within one to two coats. The cure temperatures and oven time will depend on the component or item weight. Cure temperatures and cure time will also be effected by preheating of the component.

2.1.1.1 Abrasion Resistance

The cured powder coating weight loss shall be less than 60mg per 1000 cycles, when tested in accordance with ASTM-D-4060 (Ref. E) using a Taber abraser with CS-10 wheels and a 1.0 kg load.

2.1.1.2 Adhesion

The cured coating must pass without any lifting of the coating, when tested in accordance with ASTM-D-3359, Method A (Ref. F).

2.1.1.3 Chemical Resistance

The chemical resistance of powder coatings to 24-hour immersion in salt water and fuel oil shall be tested in accordance with ASTM-D-870 (Ref. G), with no resultant blistering, disbonding or softening.

2.1.1.4 Color and Gloss

The color and gloss of the curing coating must be in accordance with that specified for the particular component in NAVSEA S9086-VD-STM-000, Chapter 631 (Ref. H). The color must match the following:

Haze Gray	FED-STD-595-26270	(40-50% gloss)
Red	FED-STD-595-21105	(40-60% gloss)
Yellow	FED-STD-595-23538	(40-60% gloss)
Black	FED-STD-595-27038	(40-60% gloss)
Flat Black	FED-STD-595-37038	(0-10% gloss)
White	FED-STD-595-27875	(40-60% gloss)
White	FED-STD-595-27886	(40-60% gloss)

2.1.1.5 Hardness

The cured coating shall have a pencil hardness of 2H or greater when determined in accordance with ASTM-D-3363 (Ref. I).

2.1.1.6 Impact Strength

The cured coating, at an average thickness of 8-mils, shall be capable of withstanding a mechanical shock load of not less than 100 in/lb, on direct impact, when tested in accordance with ASTM-D-2794 (Ref. J).

2.1.1.7 Overbake Stability

The powder coating shall be able to sustain a 100% overbake without yellowing or any reduction in performance properties.

2.1.1.8 Salt Spray Resistance

The cured coating applied to ASTM-A-570 copper-free hot-rolled carbon steel and given 1000 hours minimum exposure in the salt-spray booth shall have less than 1/4 in creepage from scribe when tested in accordance with ASTM-D-2794 (Ref. K).

2.1.1.9 Shelf Life

The shelf life of the uncured resin shall not be less than one-year from the date of manufacture when stored in original unopened containers below 80°F and 50% ± 10% relative humidity. **Note:** Storage requires environmental control.

2.2 ABRASIVE BLASTING MEDIA

2.2.1 Rough Blasting for Cleaning

Crushed garnet abrasive blasting media with a mesh size from 30 to 60 shall be used to clean painted, rusted/oxidized metallic surface.

2.2.2 Anchor-Tooth Blasting

Aluminum oxide abrasive blasting media with a 80 mesh size shall be used to provide the anchor tooth of 1 to 2 mils maximum measured with profile tape (Testex, Inc. or equivalent) during final surface preparation of the substrate.

2.2.3 Restrictions

(A) Abrasive particles shall be clean, dry, sharp and free of rust and excessive fines.

(B) Abrasive particles shall not contain any feldspar or other mineral constituents that tend to break down and remain on the surface. Abrasive particles that have been used for cleaning contaminated surfaces shall not be used for final surface preparation, even if the abrasive has been rescreened.

(c) Abrasive blasting pots and hoses must be clean and uncontaminated. It is advisable to "dedicate" blasting pots and hoses to the anchor-tooth blasting operation.

(d) Prior to use, the crushed garnet and aluminum oxide grit shall pass the following oil contamination test:

(i) Fill a clean 5-ounce vial or bottle half full of abrasive particles.

(ii) Fill the remainder of the vial or bottle with clean water.

(iii) Cap and shake the vial or bottle.

(iv) Inspect water for oil sheen.

(v) If any oil is observed, the abrasive particles shall not be used.

This test must be repeated for each reuse of anchor-tooth blasting media.

2.3 PROCESS AIR

The air equipment used in the abrasive blasting process and the powder coating process shall furnish air which is free of oil and moisture (maximum of 5 mg/m^3 of hydrocarbons) and maximum of 35°F dew point at the maximum flow rate (CFM) and maximum pressure (lb/ft^2). The air supply shall be adequate to maintain a minimum pressure of 75 lbs. per square inch (lb/in^2) at the blast generator.

2.4 MASKING MATERIALS

Any masking material that provides adequate protection of the substrate through both the abrasive blasting and curing operations without causing substrate corrosion or contamination may be used. Acceptable masking materials include various high temperature tapes, plastic caps or plugs, hose sections or metal inserts.

The masking tapes used are:

(A) 1/2" Green Duct Tape, NSN 8315-00-890-987Z.

(B) 2" Green Duct Tape, NSN 8315-00-074-5100.

(C) Hi-Temp Foil Tape (0.007" thick, 3/4" wide x 36 yd per roll, Stock No. 06004). T&F Division of SHR Industries, 3660 Edison Place, Rolling Meadows, IL 6008, or an equivalent tape able to withstand temperatures up to 450°F.

2.5 CLEANING MATERIALS

2.5.1 Solvents

Ethyl Alcohol (denatured) conforming to O-E-760, toluene conforming to TT-T-548, and trichloroethane conforming to O-T-620C are approved cleaning solvents.

WARNING:

Toluene and ethyl alcohol are flammable. Ethanol, toluene and trichloroethane are toxic. Use only in well-ventilated spaces. DO NOT use near open flames, blasting, thermal spraying work or sources of sparks. DO NOT allow prolonged contact with bare skin. Read and follow precautions on container shipping labels before using contents.

2.5.2 Alkaline

The alkaline cleaning agent is made up of three chemicals: tribasic sodium phosphate dedocahydrate; pentahydrate sodium metasilicate, technical grade; and detergent, nonionic, Type II, water soluble (MIL-D-016791, Type I). The solution shall consist of 8 lbs. sodium phosphate tribasic, 3 lbs sodium metasilicate and 3 pts. water soluble nonionic detergent (MIL-D-016791, Type I) in 50 gallons of fresh water. Refer to NSTM Chp. 631, Section 2 for health and safety requirements (Ref. K). In 0.1N concentrations, these materials are extremely caustic and can be harmful to skin, eyes and any body contact. **USE CAUTION!** Read and follow precautions on container shipping labels before using contents.

2.6 QUALITY CONTROL

A dial micrometer is used to measure the anchor-tooth surface profile off of the Press-O-Film tape (or equivalent) that had been applied to the surface. The Press-O-Film shall be extra coarse and may be ordered from Testex, Inc., P. O. Box 867, Newark, Delaware 19711.

SECTION III

SAFETY

3.1 GENERAL

The primary responsibility for safety rests with the individual, non-supervisory personnel who have been assigned to perform the work. The individual's skill level and knowledge of potential hazards is the first guard against unsafe conditions.

The operator's responsibility for safety is shared by his supervisor and all higher levels of management who must ensure that the operator has had the requisite training, is provided sufficient guidance and direction and maintains the required proficiency. In addition, periodic monitoring of all safety requirements should be made to assure they conform to the applicable Federal Occupational Safety and Health Administration (OSHA) Standards and Regulations, (29 CFR 1910) (Ref. L). Particular attention should be paid to sections 1910.94, 1910.106 and 1910.107. Detailed safety information is given in National Fire Protection Association (NFPA) Standards 33 and 70 (Refs. M and N).

3.2 PRECLEANING

When using solvents or alkaline cleaners, all applicable sections of NSTM, Ch. 631 Section 2 and the applicable NAVOSH Manual apply when performed by Naval personnel. All applicable OSHA rules and regulations shall apply to other industrial activities and manufacturer's safety instructions. Avoid inhalation of solvent fumes and contact with skin as much as possible.

3.3 ABRASIVE BLASTING

When performing abrasive blasting, the current NAVOSH Manual and Sections 631-2.272 through 631-2.288 of NSTM Ch. 631 apply for SIMA(SD) personnel. All applicable OSHA rules and regulations apply to other industrial activities.

3.3.1 Flammable Residues or Fumes

If the items previously contained flammable materials, it shall be purged of dangerous concentrations and must be certified safe by a Gas-Free Engineer prior to any abrasive blasting.

3.3.2 Grounding

Blast hose shall be grounded to dissipate static charges.

3.3.3 Protective Clothing

Face shields with dust hoods or helmets with forced-fed purified air shall be used to protect the eyes, face, chin and neck from airborne particles. Safety glasses or goggles shall be worn by all persons near any blasting operation.

3.4 ELECTROSTATIC SPRAY POWDER

3.4.1 Spray Booth

Powder-in-air concentration of greater than 0.05-0.07 oz per cubic foot can be ignited by hot flame or strong electrical discharge. Proper application equipment shall be used to keep powder-in-air concentrations below 0.01 oz ft^3. Spray booths are designed for single gun or multi-gun operation. The use of more guns than as specified for the booth will create a dangerous powder-in-air concentration and so must never be done. The spray equipment shall be interlocked with the booth blower so that no powder may be sprayed when the ventilation is shut off. The work floor of the coating area must be electrically conductive. All metal objects within 15 ft. of spray gun must be grounded. **DO NOT spray near any source of ignition.**

3.4.2 Component Suspension Devices

Hangers shall be clean to assure good electrical ground of component and to avoid static electrical discharge. The component shall be well-grounded (0-300 ohms) when the electrostatic voltage is maintained at 50-100 Kv.

3.4.3 Personnel Precautions

3.4.3.1 Respiration - Personnel operating the spray equipment shall wear respiration masks approved by NIOSH. These powders are classified as "nuisance dust" and are not toxic.

3.4.3.2 Skin Contamination - Personnel should minimize contact with the powdered resin to avoid possible irritation or allergenic reaction. Long sleeve work clothing and cotton paint hoods should be worn. If powder gets on skin, it should be removed with soap and water. Safety glasses or goggles are recommended but not required.

3.4.3.3 Electrical - Personnel in the spray area must wear electrically conductive shoes (e.g., leather soles), or leg stats so that there is less than 50 megohms resistance between themself and earth ground. The operator should hold spray gun in bare hand. If gloves are worn, the palm should be cut out to assure skin-to-metal contact.

3.4.3.4 Heat - The sprayed component is heat cured to complete coating polymerization. The oven temperatures used are from 325 to 450°F. Personnel handling these components after the cure cycle shall wear heat-resistant gloves and use extreme care to avoid contact with exposed skin areas.

3.4.4 Powder Resin

The Material Safety Data Sheet, Form OSHA-20 or equivalent, must be kept on file for each powder product in Shop files and SIMA Safety Office.

SECTION IV

QUALITY CONTROL

4.1 PRODUCTION QUALITY CONTROL RESPONSIBILITY

The following inspection procedures shall be followed by the Shop Quality Control Inspector for all powder coating work accomplished by the Corrosion Control Shop.

4.2 RECEIPT INSPECTION - A receipt inspection shall be accomplished as follows:

(A) Conduct a visual inspection to determine if welding, structural repairs, removal of prior coatings or further disassembly is required. If repairs are required, notify shop supervisor so item can be routed to applicable shop. If further disassembly is required, advise shop supervisor that further disassembly is required before shop acceptance.

(B) Inspect Ship-to-Shop Tag (Enclosure 1), attached to the item for completeness and give Part 3 to the ship's representative.

(C) Utilize a Production Control Record (Enclosure 2) for each lot of similar items on the SIMA Job Order. Assign a Production Control Number from the Production Control Work Log. Enter this number in the serial number block of the Ship-to-Shop Tag. The Production Control Number will consist of:

- The letter designation of the IMA.
- A sequential four-digit number beginning with 0001.

Example: For an item that was coated at SIMA, San Francisco, a typical production control number would be S-0001.

(D) Attach a metal dog tag with the Production Control Number stamped on it. After the metal tag is attached, remove the Ship-to-Shop Tag and staple it to the Production Control Record.

(E) Release item for precleaning. Free from oil, grease and other contamination. Visual inspection.

4.3 MASKING INSPECTION - A masking inspection shall be conducted as follows:

(A) Ensure that only masking materials and plugs designed to withstand up to 450°F temperature exposure are used for oven operations. The standard green duct tape is sometimes preferred for blasting operations and may be thus used, but it should be replaced with heat-resistant aluminum or fiberglass tape prior to placement of the component into the oven.

(B) Visually inspect items to ensure that all areas not to be coated ("fit and function" surfaces and openings) are either masked off or plugged. Ensure masking is tightly adherent to the substrate and to itself when applied in multiple layers.

4.4 STRIP-BLASTING INSPECTION - A strip-blasting inspection will be conducted after strip blasting as follows:

(A) Ensure that all scale, rust and paint has been removed.

(B) Ensure that all masked areas are still intact. Remask as required.

(C) Inspect for warpage, cracks, bad welds or over blast. Take corrective action as necessary to correct any discrepancies.

(D) Random grit-mesh-size measurements shall be taken prior to the first daily production run and at the end of the daily production run.

4.5 ANCHOR-TOOTH-BLAST INSPECTION - An anchor-tooth-blast inspection will be conducted after anchor-tooth blasting as follows:

(A) Visually inspect and ensure that all masked areas are still intact. Remask as required.

(B) Visually inspect and ensure that all areas at each component in the lot are uniformly blasted to white metal (SSPC-5).

(C) Measure the anchor-tooth profile at a random location on at least one randomly-selected component from the lot, minimum. Use Press-O-Film (x-coarse) and calibrated dial micrometer thickness gage (MITUTOYD #7326 or equivalent).

(D) Ensure that anchor-tooth profile is 1 to 2 mils.

(E) Enter measurement, date and initial the Press-O-Film Tab and attach the tab to Production Control Record.

(F) Sign Production Control Record in Section 4 for the Anchor-Tooth Blast inspection.

(G) Release to powder coat ensuring that coating operation is started within four hours after anchor tooth surface preparation. If more than 15 minutes is expected to lapse between the surface preparation and the start of the coating process, the prepared anchor-tooth surface shall be protected from moisture, contamination and fingermarks. Wrapping with clean paper will normally provide adequate protection.

(H) Ensure that the equipment operators are noting the date and time of their process sequence completion on the Production Control Record.

4.6 POWDER COAT INSPECTION - A post powder coating inspection will be conducted as follows:

(A) Ensure that the powder application was started within four hours after the anchor-tooth surface preparation.

(B) Visually inspect all components processed with a 10X power magnifying glass. The coating shall be uniform, have no blisters, pinholes, cracks or chips.

(C) The coating's cure shall be checked by lightly tapping the coating with a metal object, such as a putty knife or screw driver. A properly cured coating will be resilient to the metal object. If the coating is brittle and breaks at the point of contact, the coating fails and must be completely removed and reprocessed. Over-cured coatings are typically dull and brittle. If the coating is soft and permanently indented, the object shall be placed in the oven at the curing temperature for another five minutes and again inspected afterwards.

(D) Calibrate thickness gages for ferrous substrates and aluminum substrates at first measurement in the morning and the afternoon. A magnetic flux measurement device is used for non-conductive coatings over mild steel. An eddy-current measurement device is used on non-conductive coatings over aluminum.

(E) Measure each item ensuring that the required coating thickness was attained, 8 to 12 mils. Thickness measurements will be taken in at least five random locations per item. If the coating thickness is unacceptable, the item shall be returned for reprocessing. (Refer to Section 6.10)

(F) Sign Production Control Record in Section 10 Cured Coating Thickness. Record the high and low thickness measurements taken, the date and time.

(G) Release to final assembly area.

4.7 FINAL ASSEMBLY INSPECTION - A final assembly inspection will be conducted as follows:

(A) Ensure that all masking and plugging material is removed.

(B) Ensure that, if required, installation kit and instructions are complete and are attached.

(C) Ensure that items are properly protected and stowed in such a manner as to protect all coated surfaces for the transport from the CC Shop to installation on the customer ship. Make certain that the items are properly stacked/placed on the truck used.

4.8 ABRASIVE BLAST MEDIA INSPECTION

The SQCI shall be responsible for the inspection of all new and used abrasive blast media for both the rough blasting and anchor-tooth blasting operations. The actual inspection may be performed by another assigned CC Shop Technician, but daily reports must be provided to the SQCI.

(A) All new shipments of crushed garnet (30-60 mesh) and aluminum oxide (80 mesh) must be sampled and tested to assure that they comply with restrictions "A" and "D" of Section 2.2.3.

(B) The crushed garnet utilized in the rough blaster shall be checked at each cycle through the pressure pot for excessive fines by using a 60 mesh screen on the sample. If excessive fines exist than the media must be replaced.

(C) The aluminum oxide utilized in the anchor-tooth blaster shall be checked at each cycle through the pressure pot for excessive fines by using an 80 mesh screen and tested for oil contamination according to part "D" of Section 2.2.3.

SECTION V

OPERATOR TRAINING

5.1 TRAINING

SIMA CC Shop personnel shall be trained for applying the NAVSEA CC System 4 by completing the 3-day "CC Shop Electrostatic Spray Powder: Equipment and Application Process Course" (Ref. O). The course covers the theory and practical aspects of powder coating systems; the production process of the powder coating system (receipt inspection/item identification, surface preparation, masking, anchor-tooth blasting, powder spraying and curing; quality control; record keeping; DoD-STD-XXXX; this SIMA Process Instruction; and CC Shop operations (work stations and product flow, productivity and standard times, QC, consumables and supply support.) Approximately 1/3 of the time will be classroom training; 2/3 hands-on shop training in the SIMA CC Shop.

The major training source documents are:

- NAVSEA Ship Class Corrosion-Control Manuals (Ref. A).
- DoD-STD-XXXX, Powder Coating Systems for Corrosion Protection Aboard Naval Ships.
- NAVSEA S9086-VD-STM-000/CH-631 (Ref. H).
- NFPA Standard 33, Spray Application Using Flammable and Combustible Materials (Ref. M).
- Equipment Manufacture Operator and Field/Factory Maintenance Instructions.
- This Process Instruction.

SECTION VI

METHOD

6.1 SHIP EQUIPMENT/COMPONENTS RECEIPT

Acceptance by the CC Shop of ship equipments/components for processing shall be accomplished by the Shop Petty Officer assigned to tracking the production status of work accomplished by the Shop. Refer to Section 4 for responsibilities of the SQCI during product receipt. A Production Control Record is initiated for each SIMA Job Order. The operators must note the time and date of completion of each sequence.

6.1.1 Receipt Requirements

(A) Only ship items which are noted in the SIMA Job Order shall be accepted.

(B) Only items which have been properly disassembled to their smallest easily removed components shall be accepted.

(C) Components which arrive noticeably damaged cannot be accepted and must be rerouted by the ship for repair or replacement.

6.2 PRECLEANING

Prior to any masking, blasting or spraying, surfaces shall undergo the following:

6.2.1 Degreasing

Surfaces that have come in contact with oil or grease shall be solvent cleaned. Solvents shall be in accordance with Section 2.5. Cleaning should be accomplished by vapor degreasing, but may also be performed by wiping and brushing.

6.2.2 Additional Cleaning

After solvent cleaning, if surfaces still have deposits that may cause disruptive contamination of the blasting grit, then they may be cleaned with trisodium phosphate solution, rinsed with clear, potable water and dried.

6.3 MASKING

Refer to paragraph 2.4 for masking material.

(A) All threaded areas must be masked. Only high-temperature tape and plugs designed to withstand up to 450°F shall be used. Any green duct tape utilized for the abrasive blasting operations shall be replaced with high-temperature aluminum foil or nylon tape.

(B) As little masking as possible should be used on items to be powder coated so that as much of the item's surface as possible will be protected by the powder coat.

(C) Inspection if item, reference paragraph 4.3.

6.4 STRIP BLASTING

Refer to paragraph 2.2.1 for strip blasting material. Items shall be strip blasted to remove all old paint and corrosion products.

(A) Care must be exercised where stripping thin gage metals to prevent product warping or any other damage.

(B) Grit sizes of 30-60 mesh shall be used to prevent too large of a surface profile from being made on the surface.

(C) Strip blasting inspection shall be conducted as stated in paragraph 4.4.

6.5 HEAT CLEANING (DEGREASING)

Components with porous surfaces that have entrapped oils or greases shall be heat cleaned in a vented electric oven for four hours at 400°C. Only items being degreased may be in the oven at the same time.

6.6 ANCHOR-TOOTH BLASTING

Anchor-tooth blasting is conducted to guarantee the presence of a surface profile for mechanical bonding by the coating and to clean the surface of contamination left by the strip blasting operation. Refer to paragraph 2.2.2 for material requirement specifications.

(A) Items shall be anchor-tooth blasted to a white metal finish (SSPC-SP5) using clean grit (80 mesh) to ensure that the proper anchor tooth of 1 to 2 mils is provided and that any contamination left from the strip blasting grit is removed. The anchor-tooth profile is measured using Press-O-Film (X-coarse) and calibrated dial micrometer.

(B) Care must be exercised to prevent damaging thin-gage items. Anchor-tooth blasting should be conducted as a quick sweep of the surface, not as a metal removal procedure.

(C) After the item has been blasted, it shall be cleaned of all grit and dust by using an air gun and lint-free rags. Additional cleaning can be accomplished with denatured alcohol.

(D) The cleaned item shall be protected from moisture, contamination and fingermarks.

(E) Anchor-tooth blast inspection shall be conducted as stated in paragraph 4.5.

6.7 PREHEAT

Component preheating is required to both free the object of moisture and provide a hot surface for the powder to build up thickly when applied. Once preheated, the component should be transferred to spray area as quickly and safely as possible.

6.7.1 Thin-Gage Steel and Aluminum. These components shall be preheated for at least 15 minutes at the cure temperature, unless otherwise specified by powder manufacturers.

6.7.2 Steel Castings. Steel castings shall be preheated for one hour at the cure temperature.

6.7.3 Aluminum Castings. Aluminum castings shall be preheated for half an hour at the cure temperature.

6.8 ELECTROSTATIC SPRAY POWDER APPLICATION

Powder coating can be done in a one-coat or two-coat process depending on the type of resin and/or the coating equipment operator. Only personnel familiar with applying the resin correctly should be permitted to coat actual production items. Refer to paragraph 2.1 for material requirement specifications.

6.8.1 Receipt. Coating equipment and booth should be immediately operational upon receipt of preheated item.

6.8.2 Grounding. The components conveying/suspension system must be electrically grounded before electrostatic spray gun is operated.

(A) The suspension of parts from a rack or bar in the spray booth requires: that there be an adequate electrical connection to earth ground; and the point of contact be kept to a minimum because the contact point will not receive any powder.

(B) The wire hooks (typical diameter less than 0.13") used on the small items shall be disposed of after one use.

(C) Large hooks (typical diameter greater than 0.39") shall be checked for adequate metallic contact and periodically grit blasted.

(D) Areas which are not to be powder coated but have metal inserts or enough structural integrity to be points of suspension should be utilized.

6.8.3 Powder Coating in a Single Coat Operation. If conditions are such that the part can be coated with 8 to 12 mils of the desired resin in one coat, than this is the preferred operation. Conditions allowing this include: components mass (heat retention), powder formulation, grain size, time between preheat and spraying and operator skil.

(A) Interior areas sharp corners and edges shall be coated first with the electrostatic voltage set at least half of that used for coating flat surfaces.

(B) Apply powder to the smooth or flatter surfaces of the component utilizing three criss-cross passes (horizontal-vertical-horizontal) in slow, even strokes. The most powder shall be delivered on the first pass with the voltage set at its highest. Due to a lessening of electrostatic attraction as thickness increases, it may be necessary to turn down the voltage to prevent the repelling of incoming powder. Repelling will result in localized powder clumps on the surface. If powder begins to fall off of the item, immediately cease coating that item and check for clumps.

(C) Powder clumps should be removed by blowing them off with an air gun. The area should then be carefully recoated.

(D) When coating a surface, the gun shall remain on. By continually releasing the trigger, an uneven stream of powder is blown towards the part. Whenever first depressing the spray gun trigger, the gun must be pointed away from the component to keep from depositing clumps of powder.

(E) Once all components are sprayed, they shall be returned to the oven immediately for complete curing (refer to Section 6.9).

6.8.4 Powder Coating in a Two-Coat Operation. If conditions are such that the part must be coated with 8 to 12 mils of the desired resin in two coats, then perform the following:

(A) Interior areas sharp corners and edges shall be coated first.

(B) Apply powder to the smooth or flatter surfaces of the component utilizing three criss-cross passes (horizontal-vertical-horizontal) in slow, even strokes. The most powder shall be delivered on the first pass with the voltage set at its highest. Due to a lessening of electrostatic attraction as thickness increases, it may be necessary to turn down the voltage to prevent the repelling of incoming powder. Repelling will result in localized powder clumps on the surface. If powder begins to fall off of the item, immediately cease coating that item and check for clumps.

(C) Powder clumps should be removed by blowing them off with an air gun. The area should then be carefully recoated.

(D) When coating a surface, the gun shall remain on. By continually releasing the trigger, an uneven stream of powder is blown towards the part. Whenever depressing the spray gun trigger, the gun must be pointed away from the component to keep from depositing clumps of powder.

(E) Return sprayed parts to curing oven for 5 minutes to gel the coating.

(F) Repeat 6.8.4.A-D.

(G) Return components to oven for complete cure (refer to section 6.9).

6.9 CURING

The coating is cured at the temperature specified by the resin manufacturer. Manufacturers provide a range of temperatures and time schedules. The operators should choose one that provides a complete cure in 10-20 minutes. Manufacturers' recommendations for utilizing variations of the standard cure schedules should be followed for components with complicated geometries. The heat transfer and retention rates of various areas on a part may cause irregular curing.

6.9.1 Cure Time. The parts should remain in the oven for the complete cure time if they are to be single coated or are in the second coat of a two-coat operation.

6.9.2 Cool Down and Coating Inspection. Upon curing, the parts are removed from the oven. The coating should be checked for brittleness or completeness of cure while still hot by tapping it with a metal object, such as a screw driver or putty knife. Allow the component to cool, then check coating thickness as specified in paragraph 4.6.

6.10 REWORK

Any component noted by the operators or SQCI as not having a satisfactory coating shall be dealt with according to the following.

6.10.1 Thin Coatings - Components with coating thicknesses below the 8 mil minimum shall be lightly abrasively blasted in the anchor-tooth blaster to impart a surface profile into the coating. The part should then be preheated for 15 minutes at the cure temperature and powder coated once according to Section 6.8.3 or 6.8.4, whichever the lead powder coating Petty Officer believes is best.

6.10.2 Thick Coatings - Excessively thick coatings must be removed or reduced by abrasive blasting. The removal of powder coating may be assisted by baking the part at 450°F for two to three hours, then cooling to ambient temperature prior to the abrasive blasting. Follow standard procedures beginning at Section 6.7.

6.10.3 Over Baked or Charred Coatings - Complete removal of the coating is required. Begin the entire process over at Section 6.5.

6.11 FINAL POWDER COATING THICKNESS INSPECTION

The SQCI officially performs this inspection, but the operators responsible for powder application should be aware of the results. The operators need to be familiar with any problem areas. Refer to Section 4.6 for inspection procedures.

6.12 FINAL ASSEMBLY

(A) Remove all masking and plugging material.

(B) Prepare the required installation kit (i.e., fasteners, anti-seize, sealant and instructions).

C. Properly protect and package item for temporary stowage and transport to customer ship.

D. The Shop Petty Officer in charge of production tracking and the SQCI shall agree to final product release.

E. Remove metal identification tag, discard and re-attach Ship-to-Shop Tag.

F. Remove Part 2 of Ship-to-Shop Tag and notify Shop Supervisor that item is ready for pickup.

G. When Ship's Force picks up item, complete and attach Parts 1 and 3 of Ship-to-Shop Tag to Production Control Record.

SECTION VII

FEEDBACK

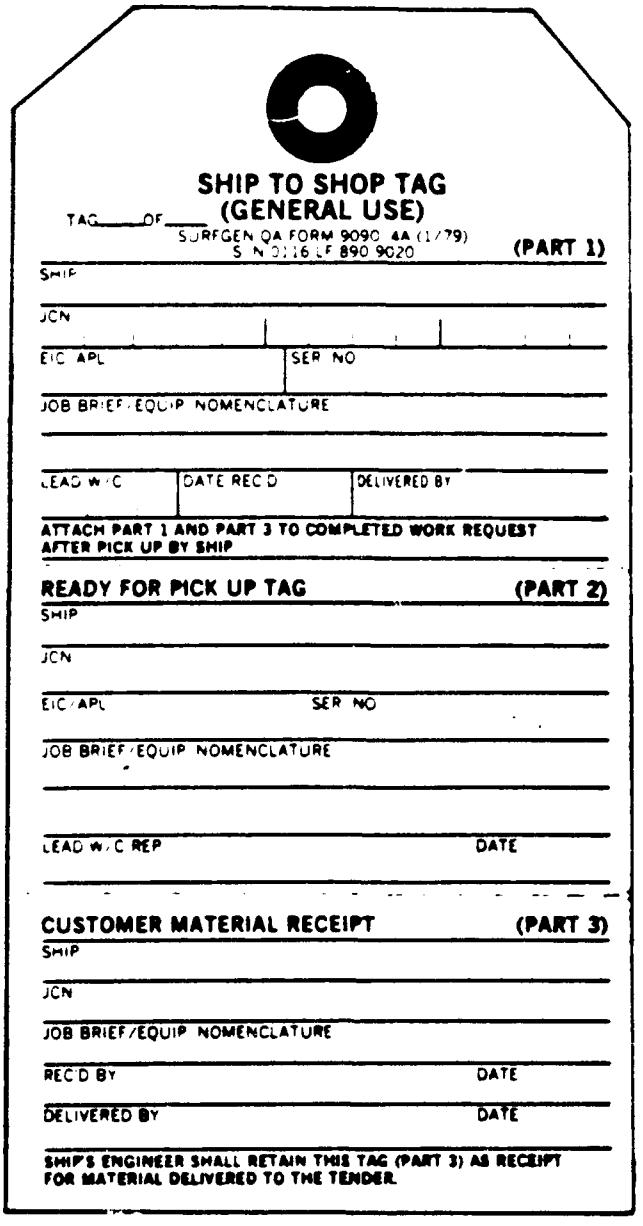
7.1 FEEDBACK INDICATIONS

In addition to the daily supervision of production and quality control, the following "feedback" indications will be used to monitor and maintain/improve the quality and productivity of the CC Shop:

(A) Verbal and written reports from customer ships and shops.

(B) Weekly analysis of the CC Shop's:

- Production input to output
- Labor and materials consumed
- PM/CM activity
- QC activity and results
- Product degradation/failure reports



SHIP TO SHOP TAG
(GENERAL USE)

TAG ____ OF ____
SURFGEN QA FORM 9090 4A (1/79)
S/N 0116 LF 890 9020

(PART 1)

SHIP

JCN

EIC/APL | SER NO

JOB BRIEF/EQUIP NOMENCLATURE

LEAD W/C | DATE REC'D | DELIVERED BY

ATTACH PART 1 AND PART 3 TO COMPLETED WORK REQUEST AFTER PICK UP BY SHIP

READY FOR PICK UP TAG **(PART 2)**

SHIP

JCN

EIC/APL SER NO

JOB BRIEF/EQUIP NOMENCLATURE

LEAD W/C REP DATE

CUSTOMER MATERIAL RECEIPT **(PART 3)**

SHIP

JCN

JOB BRIEF/EQUIP NOMENCLATURE

REC'D BY DATE

DELIVERED BY DATE

SHIP'S ENGINEER SHALL RETAIN THIS TAG (PART 3) AS RECEIPT FOR MATERIAL DELIVERED TO THE TENDER.

Enclosure 1

CORROSION CONTROL SHOP
POWDER COATING
PRODUCTION CONTROL RECORD

USS _____

Ship — Hull Number

_____ — _____

Job Control Number (JCN) — Production Control Number

_____ — _____

Item Description — Location Deck Frame Side

TYPE COATING:

_____ Epoxy

FINISH COLOR:

_____ Haze Gray _____ Red

_____ White _____ Black

_____ Other _____

SECTION	PROCESS SEQUENCE	DATE	TIME	SHOP QCI SIGNATURE
1	Receipt, Degrease			
2	Masking			
3	Rough Abrasive Blast			
4	Anchor Tooth Abrasive Blast 1-2 mils			
5	Component Preheat 15 min. 30 min. 60 min. (circle one)			Attach Profile Tape Here
6	Powder Spray, First Coat Operator Name_____			
7	Gel 5 min.			
8	Powder Spray, Second Coat			
9	Final Cure Temp____ Duration____			
10	Final Coating Thickness on all similar items in Work Order 8-12 mils			
11	Final Assembly and Packaging			

Enclosure 2

Approved for public release;
distribution is unlimited.

The views and conclusions contained in this report are those of the authors and should not be interpreted as representing the official policies, either expressed or implied, of the Naval Ocean Systems Center or the U.S. Government.