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TECHNICAL MANUAL

FOR

SHIPBOARD AUTOMATIC CHEMICAL AGENT DETECTOR AND ALARM (SHIPBOARD ACADA) MK 27 MOD 0 NSN 6665-01-484-7823

SYSTEM DESCRIPTION OPERATION AND MAINTENANCE

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Authority	Name	Signature	Organization	Code	Date
Technical	D. Acton		NSWCCD	805D	
Life Cycle	A. Moore		NAVSEA	805Z	

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PREFACE

The threat and increasing risk associated with chemical warfare (CW) agent attacks is addressed in OPNAVINST 3400.10F, Chemical Warfare and Chemical, Biological, and Radiological Defense (CW/CBR-D) policy document, which requires deployable U.S. Navy surface ships and high-threat overseas shore installations (as assessed by the Director on Naval Intelligence and Fleet Commanders-in-Chief (FLTCINCs)) to be provided with Chemical, Biological, and Radiological (CBR) defense capabilities. The Shipboard Automatic Chemical Agent Detector and Alarm (Shipboard ACADA) is a man-portable point detection system used by Naval forces to detect low-level concentrations of chemical agent vapor contamination for both interior and exterior spaces of the ship. It detects nerve (G, V) and blister (H) chemical warfare agents and provides both visual and audible alarm within 60 seconds. The most important operational feature of Shipboard ACADA is that it is able to differentiate between chemical agents and common shipboard interferents.

Operational use on ship provides alarm and agent identification to Damage Control postattack survey teams, who can notify the Commanding Officer of the presence of CW agent contamination following a chemical attack. Real-time monitoring also provides information about the onset and duration of the attack. Shipboard ACADA can also be used to determine when filter change-outs for collective and personal protective equipment are required.

This manual provides users with instructions for operating and maintaining Shipboard ACADA. The information provided includes physical and functional descriptions of Shipboard ACADA, instructions for use, and information and procedures needed for scheduled and corrective maintenance at the organizational level. Procedures for intermediate and depot-level maintenance are not included in this manual.

The equipment described in this manual was developed and tested by the Naval Surface Warfare Center Dahlgren Division (NSWCDD) and approved by the Naval Sea Systems Command (NAVSEA).

Ships, training activities, supply points; depots, Naval Shipyards and Supervisors of Shipbuilding are requested to arrange for the maximum practical use and evaluation of NAVSEA technical manuals. All errors, omissions, discrepancies, and suggestions for improvement to NAVSEA technical manuals shall be reported to the Commanding Officer, Naval Ship Weapon Systems Engineering Station (NSWSES) (Code 5H00), Port Hueneme, CA 93043B5007 on NAVSEA Technical Manual Deficiency/Evaluation Report, NAVSEA Form 9086/10. All feedback comments shall be thoroughly investigated and originators will be advised of action resulting therefrom. Three copies of NAVSEA Form 9086/10 are included at the end of each separately bound technical manual 8-1/2 x 11 inches or larger. Copies of NAVSEA Form 9086/10 may be requisitioned from the Naval Publications and Forms Center (NPFC), Philadelphia, PA 19120B5099.

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SAFETY SUMMARY

The following are general safety precautions that are not related to any specific procedures and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must at all times observe all safety regulations. Do not replace components or make adjustments inside the equipment with the high voltage supply turned on. Under certain conditions, dangerous potentials may exist when the power control is in the off position, due to charges retained by capacitors. To avoid casualties, always remove power and discharge and ground a circuit before touching it.

DO NOT SERVICE OR ADJUST ALONE

Under no circumstances should any person reach into or enter the enclosure for the purpose of servicing or adjusting the equipment except in the presence of someone who is capable of rendering aid.

RESUSCITATION

Personnel working with or near high voltages should be familiar with modern methods of resuscitation. Such information may be obtained from the Bureau of Medicine and Surgery.

RADIATION HAZARD: AMERICIUM-241 (Am^{241})

The two ion mobility spectroscopy (IMS) cells in the Detector Unit (DU) contain Am^{241}, a source of alpha radiation (total, 220 microcuries [□Ci]). The IMS cells are potentially dangerous when opened or broken. The IMS cells should be removed and serviced only at the depot. If exposed to this radiation hazard, see your ship's medical officer and report the incident to your ship's safety officer. Figure S-1 illustrates the U.S. Nuclear Regulatory Commission's Notice to Employees.

HIGH VOLTAGE COMPONENTS

The drift tube assembly has 2000-V direct current (DC) across it. The pumps and electronics operate on 28-V direct current (DC). The battery charger operates with 100-V alternating current (AC) input. Therefore, great care should be taken around this instrument, and the instrument case should never be opened while powered up.

The following warnings and cautions appear in the text in this volume, and are repeated here for emphasis.

WARNING

After exposure to a chemical warfare environment, the detector must be operated for at least 24 hr after the last exposure to chemical agents before maintenance actions 1, 2, or 3 can be safely performed without risk of causing personal injury. This period allows any ingested agent to be captured by the charcoal in the desiccant cartridge assembly. If biological agents have been used, wear a gas mask and rubber gloves when removing the intake filter, and place the old filter in a sealed plastic bag and dispose of it. (Page 4-4)

WARNING

Never use any cleaners, soap, solvents, or cloth rags when cleaning any part of the detector. Use of anything except clean paper towels and fresh water will result in system contamination. The introduction of any contaminant may have a significant effect on the ability of the system to detect chemical agent vapors. The contaminant may cause the system to false-alarm, report errors, incorrectly identify a chemical agent vapor sample, or not alarm at all if chemical agent vapors are present. (Page 4-5)

WARNING

After opening new desiccant cartridge package, never touch the new desiccant cartridge around the screw threads or cartridge seating area. This will result in system contamination. Personnel must always have clean, grease-free and oil-free hands while performing this maintenance action. (Page 4-6)

WARNING

The two ion mobility spectroscopy (IMS) cells in each detector contain americium-241, a source of alpha radiation (total per detector is 220 microcuries). The IMS cells are potentially dangerous when opened or broken. The IMS cells should be removed from the detector and serviced only at the depot. If exposed to this radiation hazard, see your ship's medical officer and report the incident to your ship's safety officer. (Page 7-1)

NRC Form 3
(8/1999)
Part I

UNITED STATES NUCLEAR REGULATORY COMMISSION
Washington, DC 20555-0001

NOTICE TO EMPLOYEES

STANDARDS FOR PROTECTION AGAINST RADIATION (PART 20); NOTICES; INSTRUCTIONS AND REPORTS TO WORKERS; INSPECTIONS (PART 19); EMPLOYEE PROTECTION

WHAT IS THE NUCLEAR REGULATORY COMMISSION?

The Nuclear Regulatory Commission is an independent Federal regulatory agency responsible for licensing and inspecting nuclear power plants and other commercial uses of radioactive materials.

WHAT DOES THE NRC DO?

The NRC's primary responsibility is to ensure that workers and the public are protected from unnecessary or excessive exposure to radiation and that nuclear facilities, including power plants, are constructed to high quality standards and operated in a safe manner. The NRC does this by establishing requirements in Title 10 of the Code of Federal Regulations (10 CFR) and in licenses issued to nuclear users.

WHAT RESPONSIBILITY DOES MY EMPLOYER HAVE?

Any company that conducts activities licensed by the NRC must comply with the NRC's requirements. If a company violates NRC requirements, it can be fined or have its license modified, suspended or revoked.

Your employer must tell you which NRC radiation requirements apply to your work and must post NRC Notices of Violation involving radiological working conditions.

WHAT IS MY RESPONSIBILITY?

For your own protection and the protection of your co-workers, you should know how NRC requirements relate to your work and should obey them. If you observe violations of the requirements or have a safety concern, you should report them.

WHAT IF I CAUSE A VIOLATION?

If you engaged in deliberate misconduct that may cause a violation of the NRC requirements, or would have caused a violation if it had not been detected, or deliberately provided inaccurate or incomplete information to either the NRC or to your employer, you may be subject to enforcement action. If you report such a violation, the NRC will consider the circumstances surrounding your reporting in determining the appropriate enforcement action, if any.

HOW DO I REPORT VIOLATIONS AND SAFETY CONCERNS?

If you believe that violations of NRC rules or the terms of the license have occurred, or if you have a safety concern, you should report them immediately to your supervisor. You may report violations or safety concerns directly to the NRC. However, the NRC encourages you to raise your concerns with the licensee since it is the licensee who has the primary responsibility for, and is most able to ensure, safe operation of nuclear facilities. If you choose to report your concern directly to the NRC, you may report this to an NRC inspector or call or write to the NRC Regional Office serving your area. If you send your concern in writing, it will assist the NRC in protecting your identity if you clearly state in the beginning of your letter that you have a safety concern or that you are submitting an allegation. The NRC's toll-free SAFETY HOTLINE for reporting safety concerns is listed below. The addresses for the NRC Regional Offices and the toll-free telephone numbers are also listed below.

WHAT IF I WORK WITH RADIOACTIVE MATERIAL OR IN THE VICINITY OF A RADIOACTIVE SOURCE?

If you work with radioactive materials or near a radiation source, the amount of radiation exposure that you are permitted to receive may be limited by NRC regulations. The limits on your exposure are contained in sections 20.1201, 20.1207, and 20.1208 of Title 10 of the Code of Federal Regulations (10 CFR 20) depending on the part of the regulations to which your employer is subject. While these are the maximum allowable limits, your employer should also keep your radiation exposure as far below these limits as "reasonably achievable."

MAY I GET A RECORD OF MY RADIATION EXPOSURE?

Yes. Your employer is required to advise you of your dose annually if you are exposed to radiation for which monitoring was required by NRC. In addition, you may request a written report of your exposure when you leave your job.

HOW ARE VIOLATIONS OF NRC REQUIREMENTS IDENTIFIED?

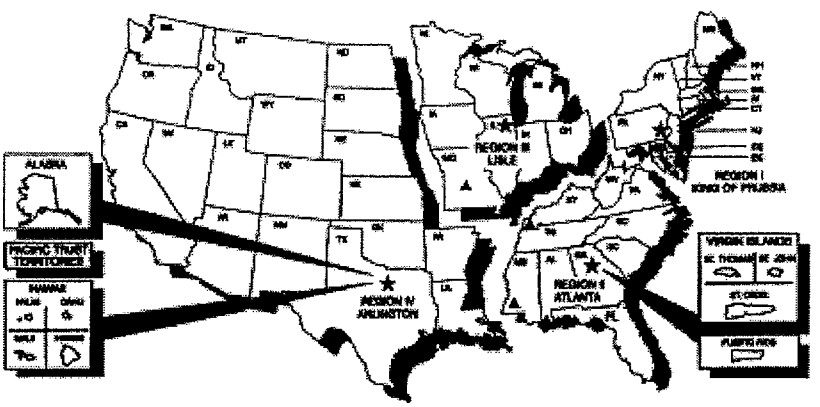
NRC conducts regular inspections at licensed facilities to assure compliance with NRC requirements. In addition, your employer and site contractors conduct their own inspections to assure compliance. All inspectors are protected by Federal law. Interference with them may result in criminal prosecution for a Federal offense.

MAY I TALK WITH AN NRC INSPECTOR?

Yes. NRC inspectors want to talk to you if you are worried about radiation safety or have other safety concerns about licensed activities, such as the quality of construction or operations at your facility. Your employer may not prevent you from talking with an inspector. The NRC will make all reasonable efforts to protect your identity where appropriate and possible.

MAY I REQUEST AN INSPECTION?

Yes. If you believe that your employer has not corrected violations involving radiological working conditions, you may request an inspection. Your request



▲ - Callaway Plant Site in Missouri and Grand Gulf Plant Site in Mississippi are under the purview of Region IV. The Paducah Gaseous Diffusion Plant in Kentucky is under the purview of Region III.

should be addressed to the nearest NRC Regional Office and must describe the alleged violation in detail. You or your representative must sign it.

HOW DO I CONTACT THE NRC?

Talk to an NRC inspector on-site or call or write to the nearest NRC Regional Office in your geographical area (see map below). If you call

the NRC's toll-free SAFETY HOTLINE during normal business hours, your call will automatically be directed to the NRC Regional Office for your geographical area. If you call after normal business hours, your call will be directed to the NRC's Headquarters Operations Center, which is manned 24 hours a day.

CAN I BE FIRED FOR RAISING A SAFETY CONCERN?

Federal Law prohibits an employer from firing or otherwise discriminating against you for bringing safety concerns to the attention of your employer or the NRC. You may not be fired or discriminated against because you:

- ask the NRC to enforce its rules against your employer;
- refuse to engage in activities which violate NRC requirements;
- provide information or are about to provide information to the NRC or your employer about violations of requirements or safety concerns;
- are about to ask for, or testify, help, or take part in an NRC, Congressional, or any Federal or State proceeding.

WHAT FORMS OF DISCRIMINATION ARE PROHIBITED?

It is unlawful for an employer to fire you or discriminate against you with respect to pay, benefits, or working conditions because you help the NRC or raise a safety issue or otherwise engage in protected activities. Violations of Section 211 of the Energy Reorganization Act (ERA) of 1974(42 U.S.C. 5851) include actions such as harassment, blacklisting, and intimidation by employers of (i) employees who bring safety concerns directly to their employers or to the NRC; (ii) employees who have refused to engage in an unlawful practice, provided that the employee has identified the illegality to the employer; (iii) employees who have testified or are about to testify before Congress or in any Federal or State proceeding regarding any provision (or proposed provision) of the ERA or the Atomic Energy Act (AEA) of 1954; (iv) employees who have commenced or caused to be commenced a proceeding for the administration or enforcement of any requirement imposed under the ERA or AEA or who have, or are about to, testify, assist, or participate in such a proceeding.

HOW DO I FILE A DISCRIMINATION COMPLAINT?

If you believe that you have been discriminated against for bringing violations or safety concerns to the NRC or your employer, you may file a complaint with the NRC or the U.S. Department of Labor (DOL) if you desire a personal remedy, you must file a complaint with the DOL pursuant to Section 211 of the ERA. Your complaint to the DOL must describe in detail the basis for your belief that the employer discriminated against you on the basis of your protected activity, and it must be filed in writing either in person or by mail within 180 days of the discriminatory occurrence. Additional information is available at the DOL website at www.osha.gov. Filing an allegation, complaint, or request for action with the NRC does not extend the requirement to file a complaint with the DOL within 180 days. You must file the complaint with the DOL. To do so you may contact the Allegation Coordinator in the appropriate NRC Region, as listed below, who will provide you with the address and telephone number of the correct OSHA Regional office to receive your complaint. You may also check your local telephone directory under the U.S. Government listings for the address and telephone number of the appropriate OSHA Regional office.

WHAT CAN THE DEPARTMENT OF LABOR DO?

If your complaint involves a violation of Section 211 of the ERA by your employer, it is the DOL, NOT THE NRC, that provides the process for obtaining personal remedy. The DOL will notify your employer that a complaint has been filed and will investigate your complaint.

If the DOL finds that your employer has unlawfully discriminated against you it may order that you be reinstated, receive back pay, or be compensated for any injury suffered as a result of the discrimination and be paid attorney's fees and costs.

Relief will not be awarded to employees who engage in deliberate violations of the Energy Reorganization Act or the Atomic Energy Act.

WHAT WILL THE NRC DO?

The NRC will evaluate each allegation of harassment, intimidation, or discrimination. Following this evaluation, an investigator from the NRC's Office of Investigations may interview you and review available documentation. Based on the evaluation, and, if applicable, the interview, the NRC will assign a priority and a decision will be made whether to pursue the matter further through investigation. The assigned priority is based on the specifics of the case and its significance relative to other ongoing investigations. The NRC may not pursue an investigation to the point that a conclusion can be made whether the harassment, intimidation, or discrimination actually occurred. Even if NRC decides not to pursue an investigation, if you have filed a complaint with DOL the NRC will monitor the results of the DOL investigation.

If the NRC or DOL finds that unlawful discrimination has occurred, the NRC may issue a Notice of Violation to your employer, impose a fine, or suspend, modify, or revoke your employer's NRC license.

Figure S-1. U.S. Nuclear Regulatory Commission's NOTICE TO EMPLOYEES (Continued)

UNITED STATES NUCLEAR REGULATORY COMMISSION REGIONAL OFFICE LOCATIONS

A representative of the Nuclear Regulatory Commission can be contacted by employees who wish to register complaints or concerns about radiological working conditions or other matters regarding compliance with Commission rules and regulations at the following addresses and telephone numbers.

REGIONAL OFFICES

REGION	ADDRESS	TELEPHONE
I	U.S. Nuclear Regulatory Commission, Region I 475 Allendale Road King of Prussia, PA 19406-1415	(800) 432-1156
II	U.S. Nuclear Regulatory Commission, Region II Atlanta Federal Center 61Forsyth Street, S.W., Suite 23T85 Atlanta, GA 30303-3415	(800) 577-8510
III	U.S. Nuclear Regulatory Commission, Region III 801 Warrenville Road Lisle, IL 60532-4351	(800) 522-3025
IV	U.S. Nuclear Regulatory Commission, Region IV 611 Ryan Plaza Drive, Suite 400 Arlington, TX 76011-8064	(800) 952-9677

To report safety concerns or violations of NRC requirements by your employer, telephone: **NRC SAFETY HOTLINE** **1-800-695-7403**	To report incidents involving fraud, waste, or abuse by an NRC employee or NRC contractor, telephone: **OFFICE OF THE INSPECTOR GENERAL** **HOTLINE** **1-800-233-3497**

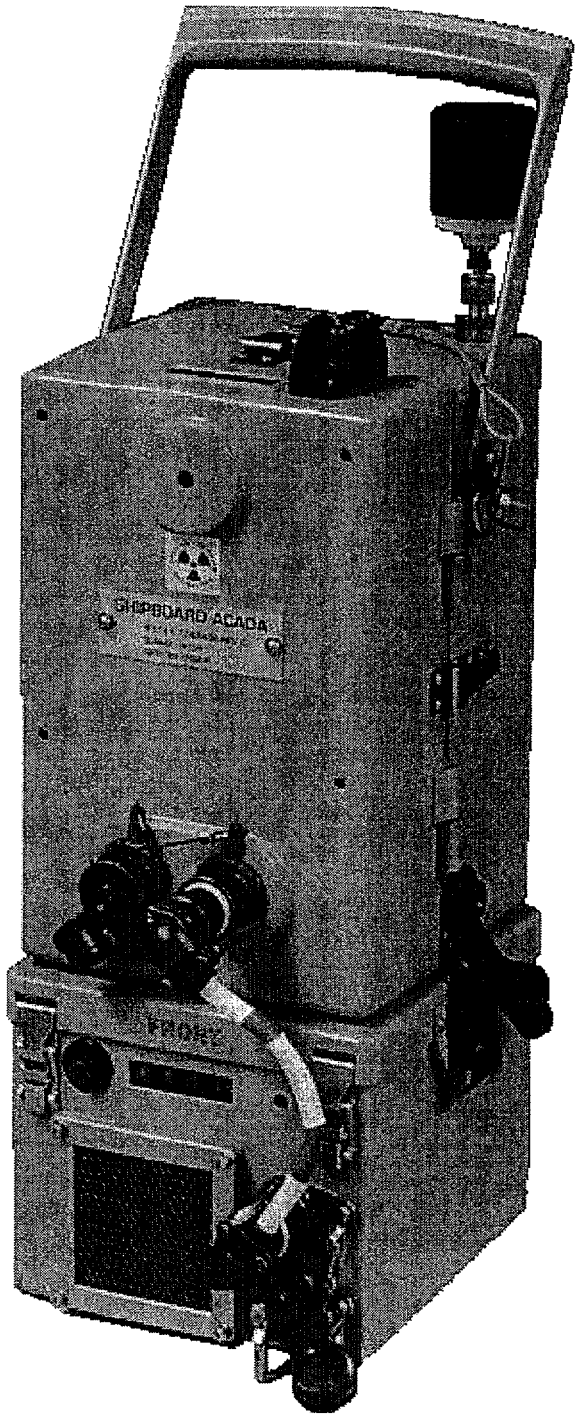
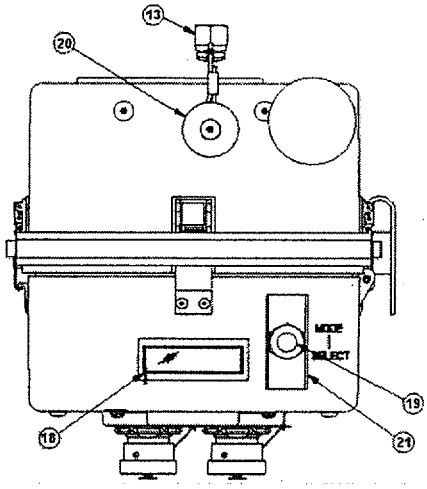
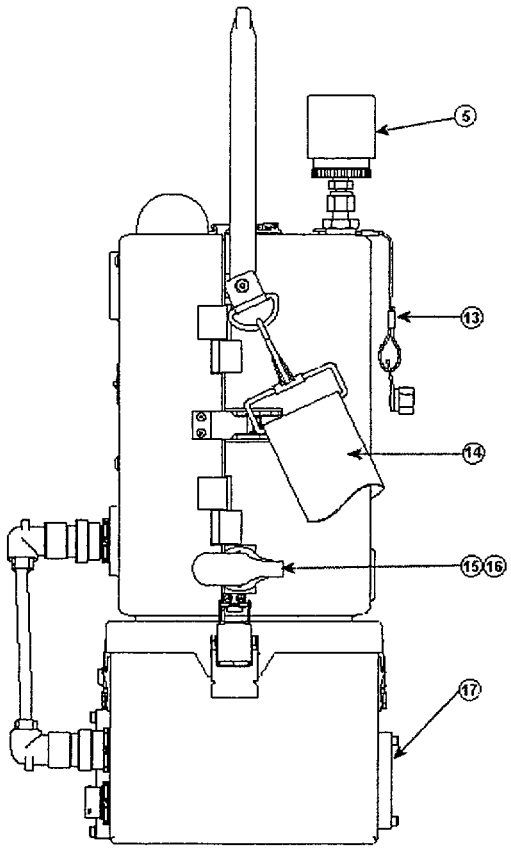


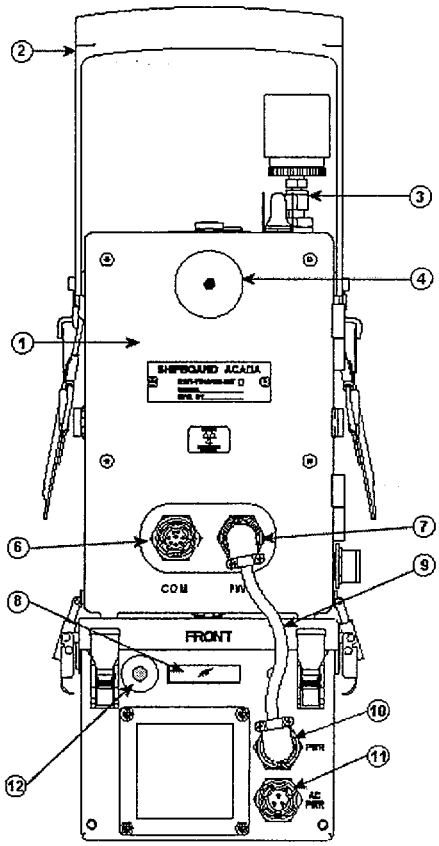
Figure 1-1. Shipboard Automatic Chemical Agent Detector and Alarm (Shipboard ACADA)

Table 1-1, Shipboard ACADA Controls and Indicators Diagram

ITEM NO.	DESCRIPTION
1	ENCLOSURE, DU
2	HANDLE
3	INTAKE PARTICULATE FILTER/ INTAKE PORT
4	HORN
5	RAIN HOOD, INTAKE
6	COM JACK
7	DU POWER IN JACK
8	POWER SUPPLY ASSEMBLY DISPLAY
9	DU POWER CABLE
10	POWER SUPPLY ASSY, DU POWER OUT JACK
11	AC POWER INTO BATT.
12	D.U. POWER ON/OFF SWITCH
13	INTAKE PROTECTIVE CAP LANYARD ASSEMBLY
14	CARRYING STRAP
15	EXHAUST PORT
16	EXHAUST PORT COVER
17	FAN
18	DU DISPLAY
19	DU MODE SELECT SWITCH
20	LANYARD RETAINER
21	SWITCH GAURD







CHAPTER 1

GENERAL INFORMATION AND SAFETY PRECAUTIONS

1-1 SAFETY PRECAUTIONS.

Personnel involved with the use and maintenance of the Shipboard Automatic Chemical Agent Detector and Alarm (Shipboard ACADA) must comply with the safety precautions included in this manual. The Safety Summary provides general safety precautions, as well as specific warnings and cautions contained elsewhere in this manual.

1-2 INTRODUCTION.

This manual provides users with instructions for operating and maintaining Shipboard ACADA. The information provided includes physical and functional descriptions of Shipboard ACADA, instructions for use, and information and procedures needed for scheduled and corrective maintenance at the organizational level. Procedures for intermediate and depot-level maintenance are not included in this manual.

1-3 EQUIPMENT DESCRIPTION.

Shipboard ACADA is a man-portable point detection system used by U.S Naval forces to detect and alarm for chemical agent vapor contamination of the air in interior and exterior spaces of the ship. It responds to nerve (G, V) and blister (H) chemical warfare agents. The most important operational feature of Shipboard ACADA is that it monitors the ship's interior ambient air in real time and detects agents at low concentrations while ignoring the presence of common interferents. Audible and visual alarm occurs in less than 60 seconds (sec).

Operational use on ship provides alarm and agent identification to Damage Control postattack survey teams, who can notify the Commanding Officer of the presence of chemical warfare agent contamination following a chemical attack. Information provided from continuous internal ship monitoring can be used to determine when filter change-outs for collective and personal protective equipment are required.

1-3.1 System Description. Shipboard ACADA (figure 1-2) consists of a single Detector Unit (DU) housing. The housing contains a heated cell assembly, an alphanumeric display panel, pumps, sample and recirculating pneumatics, electronics, and an audible piezoelectric alarm. The detector housing couples directly to a battery pack containing a sealed lead-acid battery, which acts as the power source for the detector. The battery pack plugs into 110 V-AC ship's power to recharge the batteries and has an additional alphanumeric display to indicate the charge status of the batteries. The heated cell assembly contains the IMS cells, a desiccant cartridge assembly, and an acetone source. The cells implement ion mobility spectroscopy (IMS) technology to ionize the air samples. The electronic output of the IMS cells is digitally processed to look for the presence of chemical warfare agent vapors. If the presence of agent vapors is detected, a visual display message is sent to the alphanumeric display on top of the detector and a local audible alarm is sounded.

Shipboard ACADA is designed to be used as a shipboard man-portable postattack monitoring survey

instrument that is operated by Damage Control Parties during heightened threat levels after an actual chemical attack, or for training.

1-3.2 System Hardware.

1-3.2.1 Detector Unit (DU). Enclosed in the DU (figure 1-2) are two IMS cells, all electronic circuitry and software required for detector operation, all software for signal analysis and system control, and two pumps with regulating valves that control the flow of air through the sample and recirculating flow paths.

The DU samples air through the sample intake port (figure 1-2) and divides the sample between two IMS cells that operate simultaneously to generate two different electronic waveforms or signals from the sample.

The computer software algorithm analyzes the two electronic signals generated by the IMS cells. Once the signals are analyzed, digital signals are sent to the alphanumeric display to show the appropriate messages or engage the audible alarm.

1-3.2.2 Battery Pack. When operating on ship's power 110 VAC (volts of alternating current), the battery will automatically begin charging until full charge status is reached. The battery will maintain full charge while the detector is connected to 110 VAC. Upon disconnect from 110 VAC, the batteries provide the power to operate the system for up to 2 hours. The charge status of the batteries is indicated on the battery pack display.

1-4 REFERENCE DATA.

Reference data concerning the physical and functional characteristics of Shipboard ACADA are provided in table 1-1.

Table 1-2. Reference Data

Equipment	Power Requirements	Sensitivity	Flow Rates	Operating Temperature	Storage Temperature	Shelf Life
Detector Unit (DU) (15 lb)	10.5 VDC – 16 V DC	Alarm against nerve (G, V) vapors at 0.1 mg/m^3 and blister (H) vapors at 10 mg/m^3 within 60 sec	2.0 L/m of sample	0°C (32°F) to 50°C (122°F)	-40°C (-40°F) to 70°C (158°F)	Useful ship life
Battery Module (12 lb)	12 Amp/hr	N/A	N/A	0°C (32°F) to 50°C (122°F)	-40°C (-40°F) to 70°C (158°F)	180 days

1-5 EQUIPMENT, ACCESSORIES, AND DOCUMENTS SUPPLIED.

Table 1-2 lists the equipment, accessories, and documents provided with Shipboard ACADA.

Table 1-3. Shipboard Automatic Chemical Agent Detector and Alarm (Shipboard ACADA) Equipment, Accessories, and Documents Supplied

Nomenclature	Quantity	Part Number	Overall Dimensions			Weight (lb)
			Length (in.)	Width (in.)	Height (in.)	
Shipboard Automatic Chemical Agent Detector and Alarm (Shipboard ACADA)	1	53711-7344570	7.5	7	18	26
Detector Unit (DU) Assembly	1	53711-7243432	6	6	12.5	14
Desiccant Filter Assembly	1	53711-7243490				
AC Power Cable	1	53711-7343949				
DU Power Cable	1	53711-7343948				
Power Supply Assembly	1	*53711-7343940	8	7	5.5	12
Purge Filter Assembly	1	53711-7344584				
Purge Filters	6	NSN 4240-01-206-1077				
Particulate Filter Assembly	1	53711-7343945				
Particulate Filters	10	NSN 6640-01-323-5141				
Rain Hood Assembly	1	53711-7243490				
Wand Assembly	1	53711-7344583				
Tefzel Tubing	5 Ft	.250 X .031 NAT EFTE				
Carrying Strap	1	10899				

Nomenclature	Quantity	Part Number	Overall Dimensions			Weight (lb)
			Length (in.)	Width (in.)	Height (in.)	
Unit Container	1	53711-7537885				
Stimulant Tube	1	NSN 6665–01–382–7081	1.5	1.5	5	0.5
Technical Manual	1	NSN 0640-LP-022-5610	8.5	.25	11	0.5

NOTE

*The Power Supply Assembly is a non-repairable item. It must be returned to Depot for all repairs.

CHAPTER 2

OPERATION

2-1 INTRODUCTION.

The Shipboard Automatic Chemical Agent Detector and Alarm (Shipboard ACADA) is a man-portable point detection system designed for postattack monitoring or for use as an alarm during periods of elevated threat. As a point detector, Shipboard ACADA does not inform the operator of conditions everywhere on the ship; rather, it informs the operator of conditions present at the detector intake or sample probe, and provides warning at low agent vapor concentrations.

After a chemical attack, agent may be present both as liquid and a vapor cloud around all or part of the ship; or in the event of a near miss, the vapor cloud might be all that the ship encounters. Monitoring with Shipboard ACADA would alert the crew to the presence of the agent vapor. Detector paper would indicate the presence of liquid agent in ambient air, and on surfaces of the ship.

Chemical agent considered to pose the greatest threat may be divided into two groups: nerve agents, such as GA, GB, GD, and VX, and blister agent HD, which primarily attack the skin and respiratory system. All are extremely toxic: A few breaths of nerve agent vapor can be lethal, and small amounts of blister agent can cause severe burns. These agents, when present in liquid form, can also be absorbed through the skin with lethal results.

The Shipboard ACADA Detector Unit (DU) contains two ion mobility spectroscopy (IMS) cells, which have opposite polarities so that nerve and blister agent vapors can be detected simultaneously. The DU is maintained at an elevated temperature of 160°F to eliminate the effects of the ambient environmental conditions and to prevent condensation of the agent vapor in the system.

2-2 CONTROLS AND INDICATORS.

2-2.1 Description of Controls. Figure 1-2 identifies the system operator controls and indicators on the front of the Detector, numerically cross-referenced to table 2-1, which describes the function of each control and indicator. The functions of the controls and indicators on the DU are summarized in the paragraphs that follow.

Table 2-1. Control and Indicator Functions (refer to figure 1-2)

Index No.	Nomenclature	Function
19	DU Control Switch	Controls operational modes
8	Alphanumeric Battery Display	Indicates charge state of battery in the battery housing
4	Audible Alarm	Local audible signal to alert operator to the presence of agent vapor.

Index No.	Nomenclature	Function
18	Alphanumeric Detector Display	Indicates operational status of DU and alarm status
12	DU Power Pushbutton	Supplies power to DU (Pushbutton is located on battery module)

2-2.1.1 DU Control Switch. Controls the operation of the DU.

2-2.1.2 DU Alphanumeric Display. The 8-character alphanumeric display (figure 1-2) indicates the operational status of the DU.

2-2.1.3 Audible Alarm. The audible alarm (item 4, figure 1-2) is a local, continuous, audible tone to alert the system operator to the presence of agent vapor. (Simulant alarm has an interrupted tone.)

2-2.1.4 Alarm Silence. The audible alarm can be manually silenced after it is activated by the presence of a chemical agent or simulant. The operator can turn off the alarm by pressing the toggle switch toward MODE, then selecting the SILENCE? option by pressing the toggle switch toward SELECT and then releasing it.

2-2.1.5 Battery Display. The battery alphanumeric display (item 8, figure 1-2) indicates the operational status of the battery. Table 2-2 explains the battery display messages.

Table 2-2. Summary of Battery Display Messages

Message on Battery Display	Definition of Message	Mode
Discharg	Battery is sole power source; battery operational	Battery only/ no AC
Bat low	Battery is low; needs to be recharged	Battery only/ no AC
(no display)	Battery depleted – needs to be recharged	Battery only/ no AC
Reset	Charging is not initialized. Disconnect and reconnect AC. (will go to bat check)	AC connected
Bat check	Battery charge level determination	AC connected
Charging	Charging battery	AC connected
Maintain	Battery fully charged – ready for operation	AC connected
(no display)	Battery fully charged – ready for operation	AC connected
Prq tapr	Battery disconnected – check fuses and relays	
C t luf	Battery disconnected – check fuses and relays	

2-3 NORMAL OPERATION.

Shipboard ACADA is designed to be operated during periods of elevated threat or directly following a chemical attack. A list of operational guidelines is given in table 2-3. The paragraphs that follow describe normal operating procedures for Shipboard ACADA.

2-3.1 System Operation. Table 2-3 shows the general operational modes of Shipboard ACADA.

Table 2-3. Shipboard ACADA Operational Guidelines

System Operational Modes	Selectable	System Status
Off	No	DU not operational
Purge	No	DU not operational; system is encountering an interferent
warm-up	No	DU not operational: system reaches proper operating temperature
Run mode	Yes	DU operational: system will detect and alarm on chemical agents, Built-in Test (BIT) performed every 10 min.
Diag	Yes	DU system performs BIT continuously

2-3.1.1 Activating the System.

WARNING

Before connecting system AC power, ensure that the inlet and exhaust ports are uncovered. This will prevent pulling a vacuum on the sample inlet loop and avoid potential damage to pumps or membranes in the detector.

WARNING

Ensure AC power cord is attached to Power Supply Assembly BEFORE connecting to Ship's power. Electrical shock is possible, as the connector for the Power Supply Assembly has exposed pins.

NOTE

The Shipboard ACADA must be started on AC power. The Power Supply Assembly will not initiate without AC power. The DU internal heaters will not warm the unit to operating temperatures on Battery Power.

To start the system, the operator shall:

a. Ensure INLET and EXHAUST PORTS are open.
b. Connect DU to Power Supply Assembly by fastening the two large latches on either side of the Power Supply Assembly.
c. Attach Purge Filter Assembly to Intake port on detector.
d. Attach DU power cord to DU and Power Supply Assembly.
e. Attach 6-foot AC power cord to Power Supply Assembly.
f. Connect 6-foot AC power cord to AC power. (Ship's power).
g. Press DU power pushbutton on battery box.
h. System will automatically begin to warm up.
i. When system has entered RUN mode, remove Purge Filter Assembly and install Intake Particulate Filter.
j. Perform Confidence Test (see paragraph 4-2.1.3).

2-3.1.2 Warm-up Mode. The DU must reach and stabilize at an operating temperature of 160°F before it will correctly respond to the chemical agent vapors. Under normal ambient conditions, the initial warm-up period will take approximately 30 min. During this warm-up period, the DU will display the following message:

warm up

The DU will sense when it reached this initial operating temperature. After the warm-up process is completed, the DU will then display the following message:

run mode

2-3.1.3 Purge Mode. In purge mode, the DU is non-operational due to the presence of an interfering chemical. The DU will automatically begin clearing itself of the interferent, and will automatically switch into the run-sampling detection mode. While in the purge mode, the DU will display the following message:

Purge

2-3.1.4 Run-Sampling Mode. This is the normal operating status of the system for the detection of chemical agent vapors. If the system is operating correctly, the following message will be shown on the alphanumeric display (item 18, figure 1-2):

run mode

The system is now fully operational and will detect chemical agent vapors. The DU will display error messages if any system errors occur (table 2-5).

2-3.1.4.1 Menu Selection. System Operational Modes are shown on the alphanumeric display. Other selectable modes of operation may be viewed by depressing the system switch towards MODE and releasing it as the display moves to each menu choice. To select a particular mode, depress the switch toward SELECT and release. The name of the selected mode will appear on the alphanumeric display.

2-3.1.4.2 Wand Assembly

The wand assembly consists of 5 feet of tefzel tubing connected to a steel wand. To

assemble this accessory to the detector you must first remove the rain hood from the intake. Then take the tubing end and screw this directly into the intake port. After this is done the wand can be hooked to the other end of the tefzel tubing. (Refer to figure 5-3).

2-3.1.4.3 Detection of Chemical Agent Vapor. If the DU determines and validates presence of a chemical agent, it automatically generates an alarm state. In this state, the audible alarm (item 4, figure 1-2) will sound a continuous audible signal. The following visual alarm message will be shown on the alphanumeric display (item 18, figure 1-2):

GA det, or

GB det, or

GD/GF det, or

VX det, or

HD det, or

The alphanumeric display will alternate between messages if more than one agent is detected. The alarms will continue until the agent(s) is no longer detected. The operator may choose to silence the audible alarm manually.

a. Press the DU switch toward MODE until SILENCE? is displayed; and release it. Select SILENCE by pressing the switch toward SELECT. The switch is spring-loaded and will automatically return to a neutral position.

The audible alarm will not sound again unless the DU detects another agent type. The alphanumeric display will continue to show the agent detection messages above until the DU no longer detects the presence of the agent vapor and automatically cancels the message.

2-3.1.4.4 DU Built-in Test. Every 10 minutes, the DU will automatically check its operational status by entering the DIAGNOSTIC mode and reporting updated status information. When the DU enters the diagnostic mode, the DU will display the following:

diagmode

Diagnostic messages will automatically be displayed. The diagnostic messages displayed under normal operating conditions are:

samp ok or samp hi
rec ok or rec hi
temp ok

After all diagnostic messages have been displayed, the DU will automatically return to the run mode. The DU will display the following:

run mode

2-3.1.4.5 Confidence Test. The Confidence Test is performed periodically as part of scheduled maintenance, and is used to determine if the system is working properly and capable of detecting chemical agent vapors. Chemical agent simulant vapors are intentionally introduced into the sample inlet and, if the detector is operating properly, the DU will detect, alarm, and identify the simulants.

Proper Procedure for conducting the Confidence Test is provided in Chapter 4 of this manual.

2-3.1.5 Manual Self-Test Mode. To determine the operational status of the system at any time, the operator may initiate the DIAGNOSTIC mode. The results of the BIT will be shown on the alphanumeric display (item 18, figure 1-2). Note that while in the DIAGNOSTIC mode the DU is still fully operational and will still detect and alarm in the presence of chemical agents.

2-3.1.5.1 Starting the Manual Self-Test. The operator shall:

a. Press and release system switch toward MODE until the display reads DIAGMODE?. Select DIAGNOSTIC mode by pressing the switch toward SELECT and then releasing it to select self test from -the operating menu. The DU alphanumeric display will display:

Diagmode

indicating that the system is in the diagnostic mode. If there are no system errors, the detector will display the following messages at 5 second intervals:

samp ok or samp hi
rec ok or rec hi
temp ok

Diagnostic mode can be selected from warm-up, run, or purge mode.

b. To manually scroll through the diagnostic messages, press and release the system switch toward MODE until the display reads SCROLL?. Select SCROLL mode by pressing the switch toward SELECT and then releasing it. Each time the switch is pressed towards SELECT and released, the next error message is displayed. If the switch is not pressed toward SELECT and released, the messages will automatically scroll every 5 seconds.

To manually scroll through the message again, repeat step b.

The system will continue in DIAGNOSTIC mode and will continue running diagnostics until manually switched back into the run mode. If the scroll option is not chosen, or is ignored, the DU will continue to alternately display the mode and error messages at 5-second intervals. If there are errors to report, the DU will display the appropriate error messages as shown in table 2-5.

Summaries of the messages that may be displayed on the DU and their corresponding explanations are shown in Tables 2-5 and 2-6. Troubleshooting procedures in response to the error messages are given in Chapter 5 of this manual.

Table 2-4. Summary of General Operating Messages

Message on DU	Definition of Message	Reference Paragraph

Message on DU	Definition of Message	Reference Paragraph
Warm up	DU is on, but has not yet reached operating temperature and will not detect chemical agents.	2-3.1.2
Purge	DU has encountered a contaminant. Move DU to clean space and apply purge filter.	2-3.1.3
Run mode	DU fully operational. System will detect chemical agents. This is the message seen during normal operation	2-3.1.4
Diag mode	DU is in the diagnostic (BIT) mode. DU will run diagnostic and detect and alarm in the presence of chemical agents.	2-3.1.4.4
GA det	Alarm message. Chemical agent vapor has been detected and identified as GA type agent.	2-3.1.4.3
GB det	Alarm message. Chemical agent vapor has been detected and identified as the GB- type agent.	2-3.1.4.3
GD/GF det	Alarm message. Chemical agent vapor has been detected and identified as GD or GF type-agent.	2-3.1.4.3
HD det	Alarm message. Chemical agent vapor has been detected and identified as HD-agent	2-3.1.4.3
VX det	Alarm message. Chemical agent vapor has been detected and identified as VX-agent.	2-3.1.4.3
DPM det	Alarm message. Simulant vapor has been detected and identified as the G- series simulant Dipropylene Glycol Monomethyl Ether (DPM).	2-3.1.4.5
MS det	Alarm message. Simulant vapor has been detected and identified as the H- series simulant Methyl Salicylate (MS).	2-3.1.4.5
Unk det	Alarm message. An unknown chemical is detected.	2-3.1.4.5
GA clr	Agent clear message. Chemical agent vapor levels have fallen below the detectable level for GA.	2-3.1.4.4
GB clr	Agent clear message. Chemical agent vapor levels have fallen below the detectable level for GB.	2-3.1.4.4
GD/GF clr	Agent clear message. Chemical agent vapor levels have fallen below the detectable level for GD or GF.	2-3.1.4.4

Message on DU	Definition of Message	Reference Paragraph
HD clr	Agent clear message. Chemical agent vapor levels have fallen below the detectable level for HD.	2-3.1.4.4
VX clr	Agent clear message. Chemical agent vapor levels have fallen below the detectable level for VX.	2-3.1.4.4
DPM clr	Simulant clear message. Chemical simulant vapor levels have fallen below the detectable level for DPM.	2-3.1.4.5
MS clr	Simulant clear message. Chemical simulant vapor levels have fallen below the detectable level for MS.	2-3.1.4.5
Unk clr	Unknown chemical clear message. Unknown chemical vapor has fallen below the detectable level.	2-3.1.4.5
SCROLL?	Selectable menu option to scroll through BIT error or alarm messages.	2-3.1.5.1
DIAGMODE?	Selectable menu option to enter the diagnostic mode	2-3.1.5.1
RUN MODE?	Selectable menu option to enter the chemical agent detection mode	2-3.1.4
PURGE?	Selectable menu option to enter into the purge mode.	2-3.1.3
SILENCE?	Selectable menu option to silence the audible detection alarm.	

2-3.1.5.2 Leaving the Manual Self-Test Mode. To leave the Manual Self-Test Mode, the operator shall:

Press and release system switch toward MODE until it displays desired mode. Select mode option by pressing the switch toward SELECT and then releasing it to select Run mode from the operating menu. The DU alphanumeric display will display the mode entered.

2-3.1.6 Deactivating the Detector Unit. To turn off the DU

a. Push the power button located on the Power Supply Assembly.
b. If the detector is being shut down for long-term storage, remove the battery module from the detector and connect the battery module to AC until fully charged. (See paragraph 2-3.1.1 steps e and.f)

Table 2-5. Diagnostic Mode Messages

Diagnostic Message	Description
temp hi	Temperature of the IMS cells inside the DU is above nominal.
temp lo	Temperature of the IMS cells inside the DU is below nominal.
temp ok	Temperature of the IMS cells inside the DU is ok for proper operation.
no samp	Zero pressure reading from sampling system, or transducer failure.
samp lo	Pressure of the DU sampling system pump is below nominal.
samp ok or samp hi	Pressure of the DU sampling system is within proper operating range.
no rec	Failure of the DU recirculating system or a blockage in the recirculating air circuit, or transducer failure.
rec low	Pressure of the DU recirculating system is below nominal.
rec ok or rec hi	Pressure of the DU recirculating system is within proper operating range
both flt	Neither DU IMS cell is producing proper IMS baseline signature. DU will not detect chemical agents or simulants.
pcel flt	DU positive IMS cell is not producing a proper IMS baseline signature. DU will not detect nerve agents or simulant.
ncel flt	DU negative IMS cell is not producing a proper IMS baseline signature. DU will not detect nerve agents or simulant.
both gates	Neither DU IMS cell is producing a proper IMS baseline signature. DU will not detect nerve agents or simulant.
pcel gate	Positive DU IMS cell is not producing proper IMS baseline signature. DU will not detect chemical agents or simulants.
ncel gate	Negative DU IMS cell is not producing proper IMS baseline signature. DU will not detect chemical agents or simulants.
pcel low	Positive IMS cell baseline signature peak amplitude is lower than proper range
ncel low	Negative IMS cell baseline signature peak amplitude is lower than proper range
p shift	Positive IMS cell baseline signature peak location is shifted out of proper range
n shift	Negative IMS cell baseline signature peak location is shifted out of proper range
desiccant	Desiccant cartridge is saturated.

CHAPTER 3
FUNCTIONAL DESCRIPTION

3-1 INTRODUCTION.

This section provides a functional description of the Shipboard Automatic Chemical Agent Detector and Alarm (Shipboard ACADA) operation. It includes descriptions of the basic principles of operation; as well a functional flow at both the overall and major function levels.

Shipboard ACADA consists of a Detector Unit (DU), and a Battery pack. The DU uses ion mobility spectroscopy (IMS) technology to analyze the air sample, and, if chemical agent vapors are detected, activates visual and audible alarms.

This system is designed to be used as a man-portable shipboard system to provide post-attack chemical agent contamination survey, as a point detector during heightened threat levels as a point detection system, or for training.

3-2 PRINCIPLES OF OPERATION.

3-2.1 Ion Mobility Spectroscopy (IMS). The basic concept of IMS is the production of ions in a vapor sample, and then the separation of those ions in an electric field. The terminal velocity of an ion in an electric field is a function of its charge and mass, atmospheric pressure, and molecular shape and size. Ion mobility is defined as how fast a particular ion can move through an electric field at a given temperature and pressure.

At atmospheric pressure, ions and molecules can cluster together in a way unique to the molecule producing the ions. This clustering does not need to be with similar molecules; these non-similar molecules are called reagents. The G-agent vapor molecules cluster with acetone molecules, forming positively charged cluster ions. The H-agent vapor molecules cluster with hydroxyl ions to form negatively charged cluster ions. A single-agent ion clustered with reagent molecules is called a monomer. A two- or three-agent molecule clustered with reagent molecules is called a dimer and trimer, respectively.

In this separation method, the ions start from rest at the same time to travel a known distance along a drift tube, across which a high-voltage gradient is applied. An electrode is located at the end of the drift tube to detect the ions. The smaller ion clusters have greater mobility and reach the end of the drift tube first. Heavier clusters arrive later, in order of mass. So, the arrival time is primarily a measure of the size of the cluster ions.

Each substance that is ionized produces a unique IMS signal. A substance can be identified by comparing its IMS signal, also called its IMS signature, with a set of previously recorded signatures of known substances (referred to as the "reference library"). If the substance's signature matches one of the known signatures in the "reference library," that substance can be identified. If no match occurs between the signature and the reference library, the substance is identified as unknown.

3-3 FUNCTIONAL FLOW.

3-3.1 Overall Level.

3-3.1.1 System AirFlow Circuits. The DU has a sample airflow circuit and a recirculating airflow

circuit. Flow schematics for these are shown in Figure 3-1.

3-3.1.1.1 Sample Air Flow. The exterior sample airflow of 2.0 liters per minute (lpm) is received by the DU through the sample inlet port. Once inside the DU, the flow splits between the positive and negative IMS cells. At each IMS cell, the 1.0-lpm sample flow is directed across a semi-permeable membrane. A few molecules of the sample migrate through the membrane and are entrained in the recirculating airflow. The remaining sample air is immediately exhausted out of the detector.

3-3.1.1.2 Recirculating Air Flow. The 2.0-lpm recirculating airflow is provided to maintain a clean and dry condition inside the IMS cell. The recirculating air is routed through a desiccant cartridge containing 40% molecular sieve material and 60% activated bituminous product, low ash (BPL) charcoal to remove any contamination from the recirculating airflow. (See figure 3-1).

An acetone vapor source is included in the recirculating air flow circuit of the positive IMS cell. This vapor source provides a trace amount of the reagent molecules required for reaction with the G-agent vapor molecules to form positive cluster ions. The negative IMS cell does not need a separate reagent vapor source because there are enough residual water molecules in the air to form the hydroxyl ions needed to react with the H-agent molecules.

The sample molecules that migrate through the semi-permeable membrane become entrained in the recirculating air that contains reagent vapor molecules. This sample-reagent vapor mixture then enters the ionization region of the IMS cell. The ionization region is surrounded by a radioactive source of 110 uCi of americium-241 (Am^{241}), which gives off beta particles that collide with the mixture of sample-reagent molecules. The reagent molecules will ionize and react with the sample molecules to create ion clusters.

3-3.1.2 Signal Acquisition and Analysis. After ionization of the sample molecules, an electronic gate releases the ions into the drift region. The ions are separated as they travel through the electric field in the drift tube, and impact on the collector electrode at the end of the tube. As the ions impact on the collector electrode, they give up their charge and a small ion current is generated. The small ion current is amplified and converted to a digital voltage. The time-varying digital voltage of the ions at the collector electrode comprises the sample's IMS signature. The signature resembles a chromatogram with peaks occurring at unique drift times. The signature is taken repetitively and averaged over time to yield a relatively noise-free signature.

As explained in paragraph 3-2.1 above, each sample that can be ionized has a unique IMS signature. An algorithm that compares relative signature peak location(s) and amplitudes with a library of known IMS signatures analyzes the sample IMS signature. If there is a match with an agent of interest, audible and visual alarms are initiated to alert the operator.

3.3.2 Major Function Level.

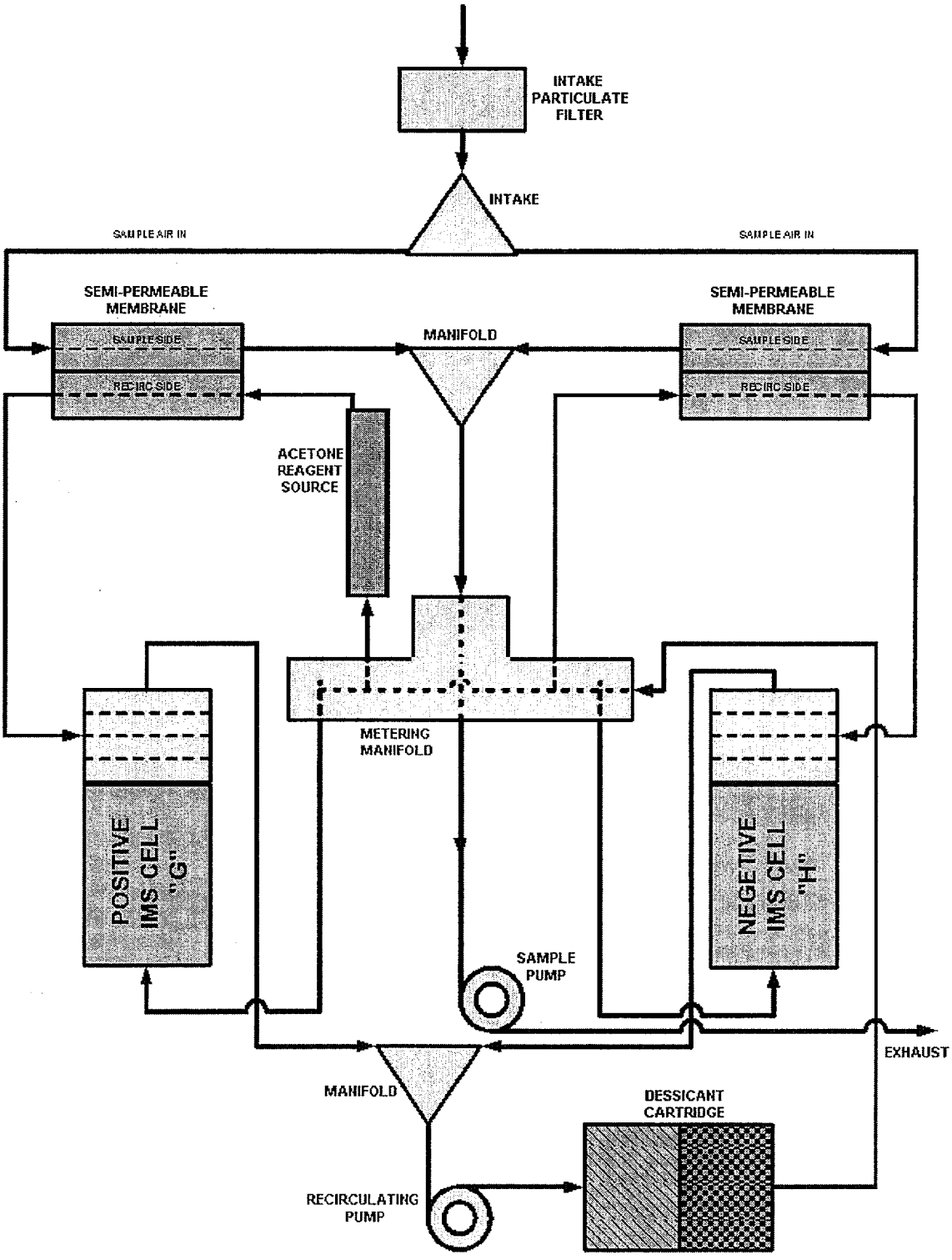
3-3.2.1 Detector Unit (DU). After the sample inlet collects the sample air, it enters the DU, where analysis of the sample is done using IMS.

The major components of the DU are described in the following paragraphs.

3-3.2.1.1 Sample and Recirculating Pumps. The sample and recirculating pumps are identical 12-VDC (volts direct current) centrifugal, graphite-vaned pumps. They move the air through the DU as

described in 3-3.1.1.

Figure 3-1 System Airflow Diagram



3-3.2.1.2 Membrane Assembly. The sample air is drawn into the detector unit through a sample inlet housing where it is distributed among each membrane assemblies. As the sample air passes over the membrane, a few sample air molecules migrate through the membrane and get entrained in the recirculating airflows. These few molecules that pass through the membranes are the only part of the original ambient air sample that actually gets analyzed by the IMS cells.

There is a single membrane assembly for both of the IMS cells in the DU. The membrane assembly consists of a stainless steel mount that holds a 1.0-mil-thick membrane of dimethyl silicone/ polycarbonate hybrid material. The purpose of the semi-permeable membrane is to selectively allow sample molecules of interest into the IMS cells while excluding excess water vapor.

Excess sample air that has passed the membrane without migrating is exhausted out of the detector.

3-3.2.1.3 Ion Mobility Spectroscopy (IMS) Cells. There are two IMS cells in each Shipboard ACADA operating simultaneously, one in the positive mode and the other in the negative mode. This capability allows the Shipboard ACADA to continuously detect both nerve and blister agent vapors. Each IMS cell consists of an ionization region, an electronic gate, the drift region, a collector assembly, the high-voltage printed circuit (PC) board, and the signal amplifier PC board.

The electronic gate controls the entry of the ion clusters into the drift region. The electronic gate is essentially two wire grids that are held at different potentials. This sets up an electric field that prevents the ion clusters from passing through into the drift region. In 30-millisecond (ms) intervals, a voltage is applied to the gate (positive voltage in the positive IMS cell and negative voltage in the negative IMS cell), which momentarily removes the potential difference between the grids. The gate "opens," and a small, discrete group of ion clusters enters the drift region.

The drift region consists of 10 circular electrodes separated by insulating spacers. A potential difference from 0 to 2000 V (positive voltage in the positive IMS cell and negative voltage in the negative IMS cell) is applied across the drift region in approximately 200-V increments, creating a uniform electric field, which accelerates the ion clusters towards the collector assembly. As the ion clusters travel the length of the drift region, they separate, due to their different mobilities in the electric field, and arrive at the collector at different times, i.e.; the smaller ion clusters have greater mobility and reach the collector assembly ahead of the heavier clusters.

As the ion clusters impact on the collector assembly, they discharge and create a small ion current. This ion current is amplified and converted to a digital voltage signal, which is the IMS signature of the sample vapor. The IMS signature is then analyzed by a software algorithm to identify the sample.

3-3.2.1.4 Desiccant Cartridge. The recirculating air flowing through the DU must be clean and dry to ensure that the incoming sample vapor is not contaminated by any internal interferents. Therefore, the DU recirculating air circuit includes a desiccant cartridge that filters out all contaminants from the recirculating air.

The desiccant cartridge is filled with molecular sieve material (size 4A) and BPL charcoal (untreated, 6 x 16 mesh size). The molecular sieve material removes residual water vapor and the BPL charcoal removes any organic contaminants.

As the DU operates, the desiccant cartridge will slowly become loaded with contaminants and will be unable to maintain the clean and dry environment inside the recirculating air circuit. The average life of a desiccant cartridge is approximately 500 operating hours. The desiccant cartridge is easily removed and replaced by ship's personnel. The used cartridges can then be returned to the maintenance depot for refilling and reuse.

3-3.2.1.5 Acetone Reagent Source. As described in paragraph 3-3.2.1.3, the ion clusters are formed in the ionization region of the IMS cell by reactions between the sample vapor molecules and reactant ions.

An acetone vapor source is required in the recirculation airflow circuit for use by the positive IMS cell to maintain a stable baseline signature. The acetone vapor source consists of a Teflon diffusion tube immersed in 50 mL of liquid acetone contained in a stainless steel vessel that is mounted next to the positive IMS cell. Just prior to entering the positive IMS cell, the recirculating air passes through the immersed tube and the acetone molecules diffuse into the tube and mix with the recirculating air at a constant rate of approximately 675 mL/min at 160°F.

A separate reagent vapor source is not required for the negative IMS cell. A small amount of residual atmospheric water vapor migrates through the semi-permeable membrane with the sample vapor and enters the ionization region. These water molecules act as the reagent for the negative ion reactions.

3-3.2.1.6 Detector Unit (DU) Electronics. The electronic circuitry that controls the operation of the DU is located inside the front access cover of the DU enclosure. An analog-to-digital (A/D) converter, a central processing unit (CPU) and Digital Signal Processor (DSP) control the operation of the DU. These functions are resident on a single Printed Circuit (PC) board.

The A/D converter receives the analog voltages from the positive and negative IMS cells and converts them to digital signals, which are then sent to the DSP for processing.

The DSP is a Texas Instruments TMS320C30 that employs a software algorithm to analyze the digital signal from the A/D converter. If the algorithm detects the presence of a chemical of interest in the vapor sample, then it will identify the chemical, immediately sound the audible alarm to alert the operator, and send an appropriate display message to the alphanumeric detector display.

3-3.2.1.7 Heaters. The IMS cells must be maintained at a constant temperature of 160 °F to operate properly. A 100-W strip heater is mounted under each of the cells to maintain their temperature and heat the surrounding components to prevent the sample vapor from condensing as it travels through the DU. The enclosure housing the IMS cells is insulated with a high efficiency low-resistance material to reduce the duty cycle on the cell heaters and conserve battery life.

3-3.2.1.8 System Controls. The system controls are located directly on top of the detector unit enclosure box subassembly and contain the system switch and the alphanumeric display. The alphanumeric display provides real-time printed information to the operator regarding the status of the system, including alarm status, agent identification, Built-in Test (BIT) information, and error messages.

3-3.2.1.9 Wand Assembly

This is used for post-attack detection. The wand is used to draw sample vapors from specific points. This accessory consists of a wand connected to 5 feet of tefzel tubing; this is hooked directly into the intake, after the rain hood has been removed. The wand attaches to the Intake Particulate Filter. (See figure 3-2), for attachment instructions refer to paragraph 5-3.3.

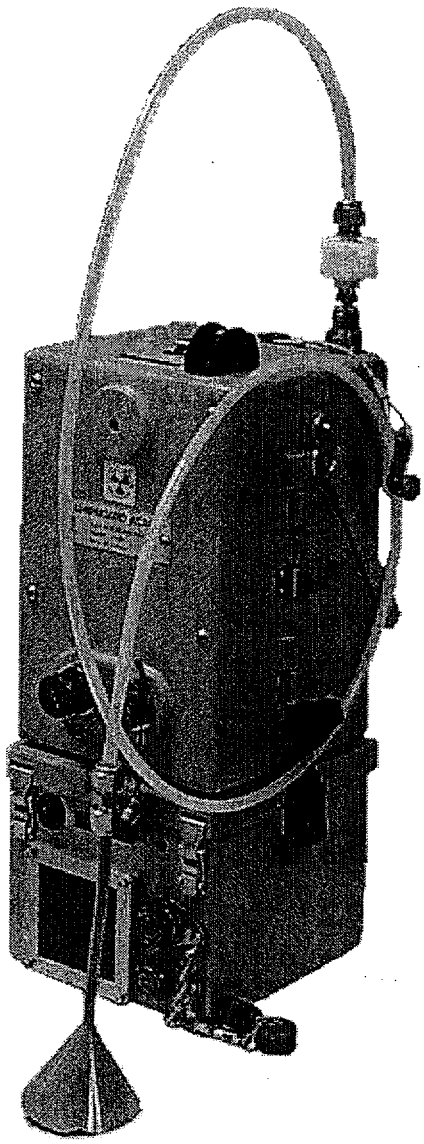


Figure 3-2,Shipboard ACADA with Wand Assembly

CHAPTER 4
SCHEDULED MAINTENANCE

4-1 INTRODUCTION.

This chapter provides scheduled maintenance procedures for the Shipboard Automatic Chemical Agent Detector and Alarm (Shipboard ACADA). These procedures include a requirement that Shipboard ACADA be powered up for 30 minutes prior to deployment to ensure that Shipboard ACADA will be operational when it is needed.

NOTE

The Shipboard ACADA must be initiated into warm-up mode by AC power. Unit will enter RUN mode when it has reached operating temperature.

The scheduled maintenance instructions in this manual are intended to duplicate those furnished in the Planned Maintenance System (PMS). In case of conflicts, the PMS documentation takes precedence. Such conflicts should be reported immediately on the NAVSEA Technical Manual Deficiency/ Evaluation Report, in accordance with the maintenance procedures for this manual.

4-2 SCHEDULED MAINTENANCE ACTIONS.

4-2.1 Manual Self-Test and Confidence Test.

4-2.1.1 Tools, Parts, Materials, Test Equipment.

a. Materials
   1. Confidence Sample (NSN 6665-01-382-7081)
b. Miscellaneous
   1. NAVSEA Technical Manual

4-2.1.2 Perform Manual Self-Test.

NOTE

Accomplish quarterly or as required when operating system.

When Maintenance Requirement Card (MRC) A-1R coincides with this MRC, perform MRC A-1R only.

NOTE

Due to sensitivity of system to small amounts of sample vapors, all confidence tests should be performed when there are no vapor-producing activities ongoing in the vicinity of the detector (i.e., painting, floor waxing, weapons fire, etc.) or during extreme inclement weather. The introduction of any contaminant may have a significant effect on the ability of the system to detect chemical agent vapors. The contaminant may cause the system to false-alarm, report errors, incorrectly identify a chemical agent vapor sample, or not alarm at all if chemical agent vapors are present.

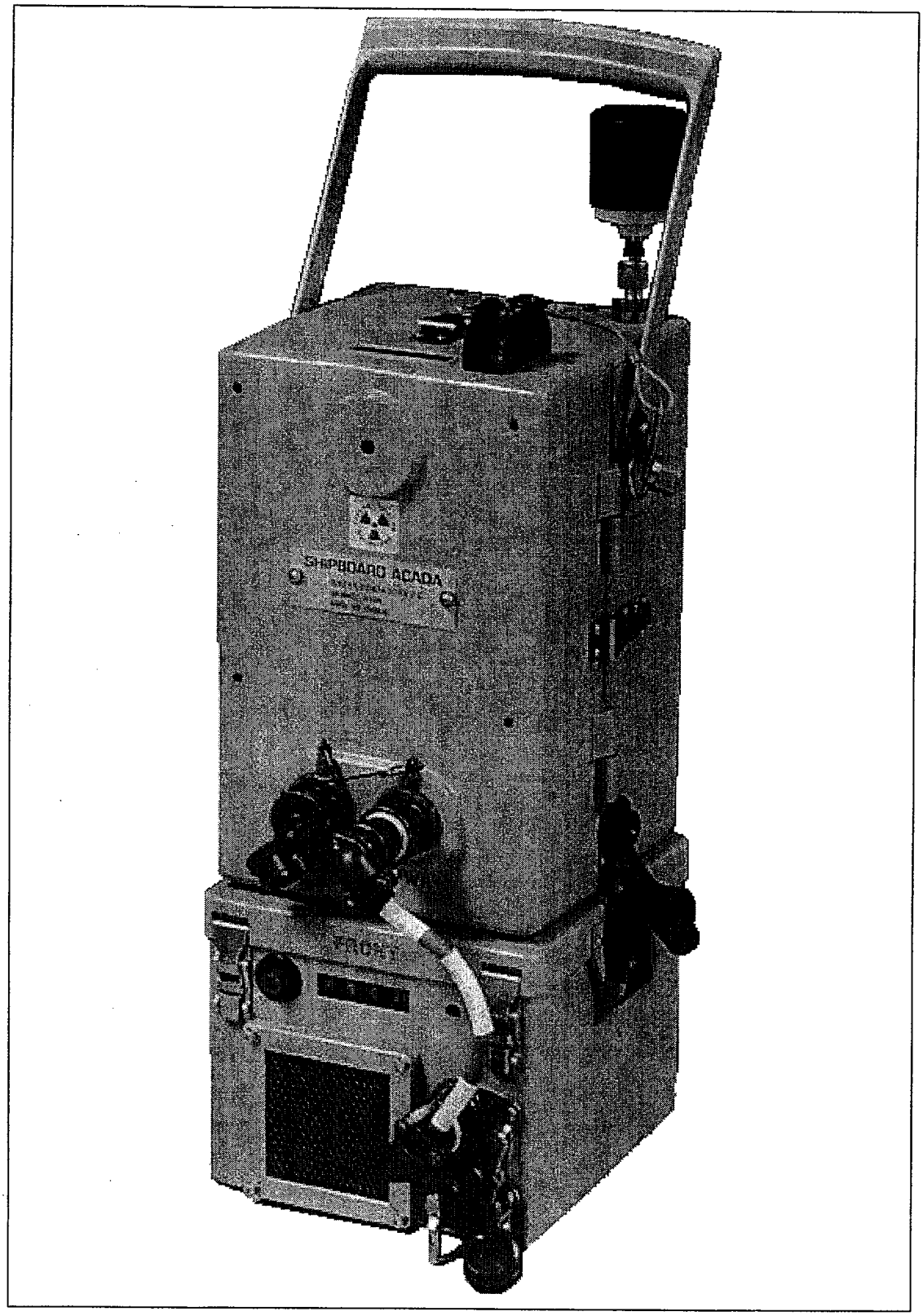


Figure 4-1. Detector Unit (DU), Front View

NOTE

Due to sensitivity of system to small amounts of sample vapors, ensure hands and clothing of personnel performing maintenance are free of all contaminants that may be detected (i.e., fuels, oils, greases, adhesives, solvents, paints, aftershave lotion, perfumes, hand lotions, etc.). The introduction of any contaminant may have a significant effect on the ability of the system to detect chemical agent vapors. The contaminant may cause the system to false-alarm, report errors, incorrectly identify a chemical agent vapor sample, or not alarm at all if chemical agent vapors are present.

a. Ensure external air intake and exhaust ports are open and free of obstructions.
b. Activate the detector by first attaching the battery case to the bottom of the detector by securing the latches at the bottom of the DU and the top of the battery box (see figure 4-1).
c. Once the battery case has been attached to the DU, power the battery box by connecting the AC power cable to the Ship's AC power (see figure 4-1).
d. Next, connect the battery power from the battery to the DU via the DU cable (see figure 4-1).
e. After the battery AC power cable and the DU cables have been connected, depress power button located on battery module.

NOTE

The system must be operating for 1/2 hr before initiating test.

f. The system will automatically enter an initial warm-up mode for approximately one-half hour.
g. System will automatically perform a built-in test and report its condition. Any error messages will be displayed on the alphanumeric display.
h. Report all discrepancies to Work Center Supervisor (WCS).

NOTE

All deficiencies must be corrected per Shipboard ACADA Technical Manual (SW073-AF-MMO-010/MK 27 MOD 0) before performing Confidence Test.

4-2.1.3 Perform Confidence Test.

NOTE

Once the system is ready to detect chemical agents or simulants, the DU will enter the run mode.

a. Remove raincap if installed on intake particulate filter assembly.

b. Open "G" end of confidence sample and place opening in contact with sample inlet on top of detector (See figure 4-1). Hold confidence sample in place for approximately 2 seconds. Remove and close end of confidence sample.
c. If alarm sounds before 30 sec, nerve agent detection is fully operational.
d. After completion of Confidence Test, system can be turned off if not needed. To turn off system, remove the battery box.

NOTE

If simulant was not detected within 60 sec, it is likely that the confidence sample has degraded or there is an interferent (paint fumes, floor wax, etc.) in the area, or the desiccant cartridge needs replacement(4-2.3.3). Repeat steps d., e., and f. with a fresh confidence sample. If unit still does not alarm, power down the system install purge filter assembly and run unit until it enters run mode. Then, try again. Up to four tries may be necessary with degraded confidence samples.

NOTE

Rapid degradation of confidence samples will occur if ends of confidence sample are left open for prolonged periods.

e. Allow unit to clear itself for approximately 5 min, and then repeat test using "H" end of confidence sample. If alarm sounds before 30 sec, blister agent detection is fully operational.

4-2.2 Restore Battery to Maximum Charge

a. Plug battery module into AC power.
b. Wait until "maintain" is displayed (usually overnight).

4-2.3 Filter Removal and Replacement.

4-2.3.1 Preliminary: De-Energize System.

WARNING

After Shipboard ACADA exposure to a chemical warfare environment, the DU must be operated for at least 24 hr after the last exposure to chemical agents before maintenance actions 1, 2, or 3 can be safely performed without risking personal injury. This time allows any ingested agent to be broken down and filtered out by the charcoal in the desiccant cartridge assembly.

NOTE

Accomplish annually or as required when operating system.

NOTE

When MRC Q-1R coincides with this MRC A-1R, perform A-1R MRC only.

NOTE

Report all discrepancies to Work Center Supervisor (WCS).

NOTE

Due to sensitivity of system to small amounts of sample vapors, all maintenance on Detector Unit (DU) should be performed when there are no vapor-producing activities ongoing on interior of ship (i.e., painting, floor waxing, etc.). The introduction of any contaminant may have a significant effect on the ability of the system to detect chemical agent vapors. The contaminant may cause the system to false-alarm, report errors, incorrectly identify a chemical agent vapor sample, or not alarm at all if chemical agent vapors are present

WARNING

Never use any cleaners, soap, solvents, or cloth rags when cleaning any part of the DU. Use of anything except clean paper towels and fresh water will result in system contamination. The introduction of any contaminant may have a significant effect on the ability of the system to detect chemical agent vapors. The contaminant may cause the system to false-alarm, report errors, incorrectly identify a chemical agent vapor sample, or not alarm at all if chemical agent vapors are present.

4-2.3.2 Remove and Replace Detector Unit (DU) Filters.

a. Miscellaneous

1. NAVSEA Shipboard ACADA Technical Manual (SW073-AF-MMO-010/MK 27 MOD 0)

b. Materials

1. Intake Particulate Filter Media.

4.2.3.3 Remove and Replace Detector Unit (DU) Intake Particulate Filter

a. Grasp rain cap (if installed), and remove by rotating counterclockwise.
b. Grasp top, ridged edge of the filter housing and lower, ridged edge of the filter housing. While holding the lower ridged edge of the filter housing to keep it from moving, rotate the top portion of the intake filter housing counterclockwise to loosen and remove it. (See figure 4-2).
c. Remove the filter material from the upper half of the filter housing and dispose of it properly, making sure that the O-ring stays in place. Place new filter media onto the lower half of the filter housing on top of the screen mesh.
d. Replace the top of the filter housing and finger tighten it by rotating it clockwise while holding the bottom of the filter housing in place. (See figure 4-2).
e. Replace the rain cap (if used), by placing it on top of the filter housing and finger tightening the cap by rotating the cap clockwise.

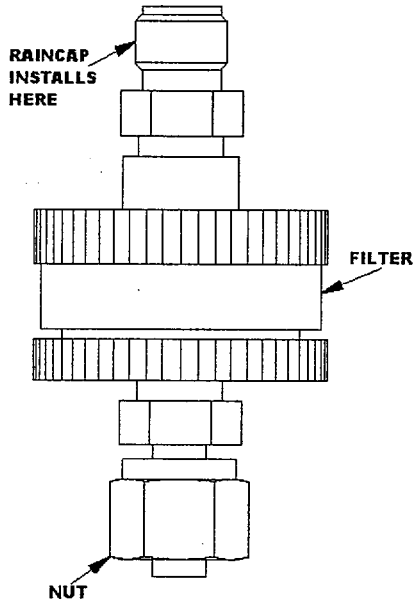


Figure4-2, Intake Particulate Filter

CHAPTER 5
CORRECTIVE MAINTENANCE

5-1 INTRODUCTION.

This chapter provides troubleshooting and corrective action procedures to be used by the operator to identify and correct the common malfunctions that might occur during operation and/or maintenance of the Shipboard Automatic Chemical Agent Detector and Alarm (Shipboard ACADA). Intermediate and depot-level troubleshooting is not included in this manual, as these procedures are beyond the scope of the shipboard maintenance and repair functions.

This manual does not address all malfunctions that could occur. If a Shipboard ACADA malfunction is not listed and/or cannot be corrected, notify the Damage Control Assistant (DCA).

5-2 OPERATOR TROUBLESHOOTING.

Table 5-1 is an operator-troubleshooting chart for Shipboard ACADA. Use the chart to identify a condition and its cause, then take the corresponding corrective action.

NOTE

If the errors listed above occur infrequently, there may be no need for corrective actions. The errors must be occurring on a continuous or consistent basis for the corrective actions in Table 5-1 to apply.

If the corrective actions shown in Table 5-1 do not correct the problem, submit a work request to your Intermediate Maintenance Activity (IMA) as shown in Table 5-1.

Table 5-1. Shipboard ACADA Troubleshooting Chart

Diagnostic Message	Description	Corrective Action
temp hi	Temperature of the IMS cells inside the DU is too high for proper operation.	*
temp lo	Temperature of the IMS cells inside the DU is too low for proper operation.	*
no samp	Zero pressure reading from sample pump.	Check intake and exhaust caps. *
samp hi	Pressure of the DU sample pump is within proper operating range.	No Maintenance Action needed *
samp lo	Pressure of the DU sample pump is below proper operating range.	Check intake and exhaust caps. *
no rec	Failure of the DU recirculating pump or a blockage in the recirculating air circuit.	Check intake and exhaust caps. *
rec hi	Pressure of the DU recirculating pump is within proper operating range.	No Maintenance Action needed *

Table 5-1. Shipboard ACADA Troubleshooting Chart (Continued)

Diagnostic Message	Description	Corrective Action
rec low	Pressure of the DU recirculating pump is below proper operating range.	Check intake and exhaust caps. *
both flt	Neither DU IMS cell is producing proper IMS baseline signature. DU will not detect chemical agents or simulants.	Return to depot
pcel flt	DU positive - IMS cell is not producing a proper IMS baseline signature. DU will not detect nerve agents or simulant.	Return to depot
ncel flt	DU negative - IMS cell is not producing a proper IMS baseline signature. DU will not detect nerve agents or simulant.	Return to depot
both gates	Neither DU IMS cell is producing a proper IMS baseline signature. DU will not detect nerve agents or simulant.	Return to depot
pcel gate	Positive DU IMS cell is not producing proper IMS baseline signature. DU will not detect chemical agents or simulants.	Return to depot
ncel gate	Negative DU IMS cell is not producing proper IMS baseline signature. DU will not detect chemical agents or simulants.	Return to depot
pcel low	Positive IMS cell baseline signature peak amplitude is lower than proper range	Return to depot
ncel low	Negative IMS cell baseline signature peak amplitude is lower than proper range	Return to depot
p shift	Positive IMS cell baseline signature peak location is shifted out of proper range	Return to depot
n shift	Negative IMS cell baseline signature peak location is shifted out of proper range	Return to depot
desiccant	Desiccant cartridge is saturated.	Change desiccant cartridges

* These messages are warnings, not errors. If confidence check is successful, they should be ignored. If confidence test is unsuccessful, replace desiccant cartridge. If confidence test is still unsuccessful, return Shipboard ACADA to depot.

5-3 CORRECTIVE ACTIONS.

5-3.1 Desiccant Filter Removal and Replacement.

a. If system is running, push the power button located on the Power Supply Assembly. If system is powered off, proceed to step b.
b. Remove battery case from DU by releasing the two latches on either side of the Power Supply Assembly.
c. Place DU on its rear surface, so the front of the unit is facing up.
d. Open the Shipboard ACADA DU by releasing latches on the top, sides, and bottom of the DU.
e. Unsnap the desiccant cartridge-retaining latch, which is located on the left side of the desiccant cartridge. (See figure 5-1).
f. Remove entire desiccant cartridge by carefully pulling it straight out from the housing inside the DU. Do not dispose of old cartridge, as it will be returned for recycling.

NOTE

To prevent contamination of new desiccant cartridge, do not open package until you are ready to install it in DU.

WARNING

After opening new desiccant cartridge package, never touch the new desiccant cartridge around the screw threads or cartridge seating area. This will result in system contamination. Personnel must always have clean, grease-free and oil-free hands while performing this maintenance action.

e. Open package containing new desiccant cartridge. Remove screws from the bottom of the cartridge. (These screws seal the cartridge to prevent contamination and moisture from entering.)
f. Press the small guide key on the bottom of the desiccant cartridge into the corresponding hole in the desiccant cartridge housing. Snap the retaining latch back in place.
g. Close the detector unit and close the latches that hold the two sides of the detector together. There are four latches, one each on the top, sides and bottom of the detector unit.
h. Return old desiccant cartridge to depot for recycling. Package old desiccant in accordance with standard ship practices and return to the In-Service Engineering Activity (ISEA) at:

Naval Surface Warfare Center,
Crane Division
Code 805D, BLDG 3324
Crane IN 47522-5001
Phone (812) 854-5725 DSN 482-5725 or
(812) 854-4050 DSN 482-4050

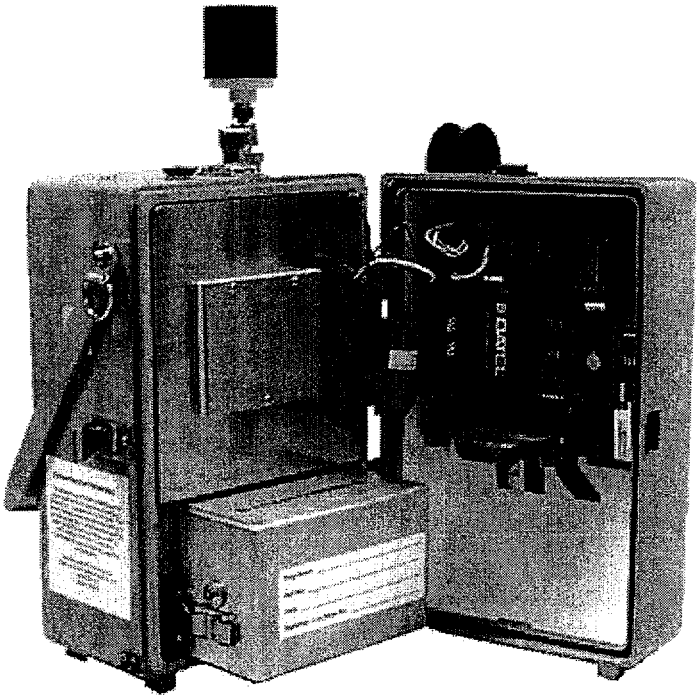


Figure 5-1, Shipboard ACADA DU Interior view

5-3.2 Installation and Removal of Purge Filter Assembly

5-3.2.1 Installation

NOTE

The Purge Filter should be replaced prior to attaching assembly to the Detector Unit. See chapter 6 for Part numbers to obtain replacement purge filters.

a. The purge filter assembly should be installed on the Shipboard ACADA Detector upon initial startup or when surrounding environmental conditions are suspected to contain contaminating vapors (i.e. paint fumes, floor waxing, etc.). If possible, move DU to a clean operating environment.

b. Remove raincap (if installed) by grasping and turning counter-clockwise.

c. Remove Intake Particulate Filter assembly by loosening the nut that fastens the assembly to the DU intake port. (See figure below).

d. Attach Purge Filter Assembly to the DU, position the filter assembly so as not to interfere with the movement of the DU handle and tighten the nut to the DU intake port. Do not overtighten.

5-3.2.2 Removal

a. To remove the Purge Filter Assembly loosen the nut attaching the assembly to the

DU intake port. Remove Purge Filter Assembly.

b. Re-install Particulate Intake Filter, and tighten nut on the DU intake port. (See figure below). Do not overtighten.

c. Re-install raincap (if used) by rotating it clockwise on tip of the Particulate Intake Filter.

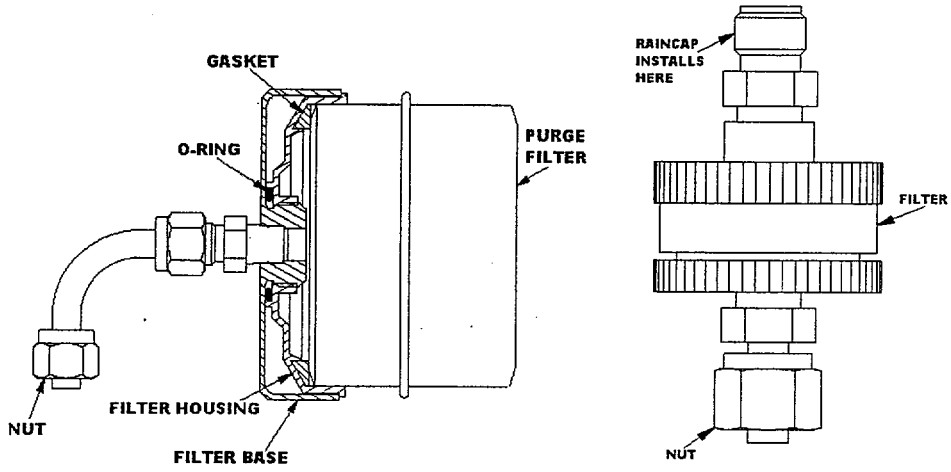


Figure 5-2, Purge Filter and Intake Particulate Filter Assemblies

5-3.3 Installation and removal of Wand Assembly.

5-3.3.1 Installation

a. Remove Rain cap from Intake Particulate Filter, (if installed) by grasping rain cap and rotating counter clockwise.

b. Attach Wand Assembly by tightening nut on end of Tefzel tubing to the top of the Intake Particulate Filter assembly.
(See figure 5-3). Do not overtighten.

5-3.3.2 Removal

a. Reverse steps outlined in para 5-3.3.1.

Figure 5-3

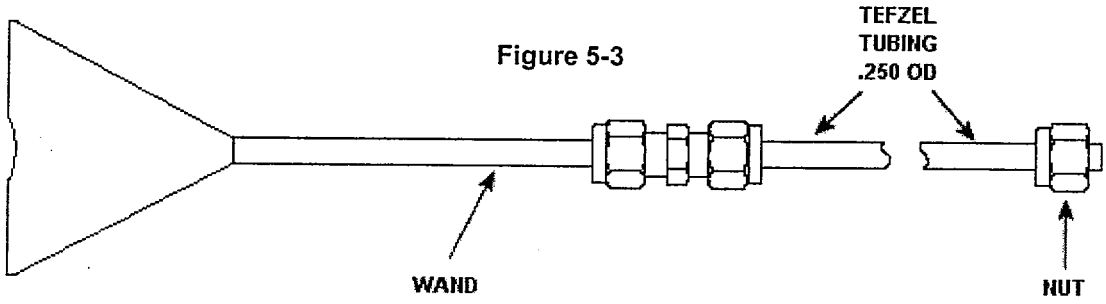


Figure 5-3, Wand Assembly

CHAPTER 6

PARTS LIST

6-1 INTRODUCTION.

This chapter identifies the spare parts that are used on the Shipboard ACADA.

6-2 LIST OF MANUFACTURERS.

Table 6-1 provides the names, addresses, and codes of manufacturers supplying spare parts for Shipboard ACADA as referenced in column 3 of the parts list.

Table 6-1. List of Manufacturers

Code	Name and Address
53711	Department of the Navy Naval Sea Systems Command Arlington, VA 22242
8F723	Mine Safety Appliance Co. 36 Great Valley Parkway Malvern, PA 19335
66343	Solberg Manufacturing 1151 West Ardmore Ave. Itasca, IL 60143
4N861	RESCO/Washington 10523 Ewing Road Beltsville, MD 20705

6-3 SPARE PARTS LIST.

Table 6-2 includes the following information for each part:

a. Column 1, Description: This column contains the name of the part and descriptive data to identify the part.

b. Column 2, Quantity: This column indicates the quantity of spare parts required per system.

c. Manufacturer Code: This column contains the original part manufacturer's federal supply code identification number.

d. Part number: This column lists the part or drawing number assigned by the original manufacturer of the part. Where applicable, National Stock Numbers (NSNs) are provided for items available from multiple sources.

Table 6-2. Spare Parts List

Nomenclature	Quantity	Cage Code	Part Number	Part Number / NSN
Shipboard Automatic Chemical Agent Detector, Alarm (Shipboard ACADA)	1	53711	7344570	6665-01-484-7823
Technical Manual	1		SW073-AF-MMO-010/MK 27 MOD 0	0640-LP-022-5610
Desiccant Filter Assembly	1	53711	7243490	6665-LL-H56-2425
AC Power Cable	1	53711	7343949	6665-LL-H56-2435
DU Power Cable	1	53711	7343948	6665-LL-H56-2436
Power Supply Assembly	1	53711	7343940	6665-LL-H56-2431
Purge Filter Assembly	1	53711	7344584	6665-LL-H56-2428
Purge Filters(Respirator cartridge)	6	53711	815180	4240-01-206-1077
Particulate Filter Assembly	1	53711	7343945	6665-LL-H56-2429
Particulate Filters Media, 25 mm	10	59728	4752D20	6640-01-323-5141
Rain Hood Assembly	1	53711	7243490	6665-LL-H56-2426
Wand Assembly	1	53711	7344583	6665-LL-H56-2427
Tefzel Tubing	5 Ft		.250 X .031 NAT EFTE	
Carrying Strap	1	53711	10899	6665-LL-H56-2432
Storage Case	1	U3092	D614-2281 (USN)	6665-LL-H56-2444
Simulant Tube	1		442-642	6665–01–382–7081
Handle, DU	1	53711	7343950	
Screws, DU Handle	2	39428	9035A202	
Lanyard Assembly, Intake	1	53711	7343946	6665-LL-H56-2433
O ring, Viton, Intake Particulate Filter	1	05668	29827-52	
Cover, Exhaust	1	53711	7343943	6665-LL-H56-2434
Cable, AC power	1	53711	7343949	6665-LL-H56-2435
Cable, DU power	1	53711	7343948	6665-LL-H56-2436

CHAPTER 7

SHIPBOARD ACADA PACKING & UNPACKING PROCEDURES

7-1 **INTRODUCTION.** This chapter contains the necessary information to unpack and pack the Shipboard ACADA unit.

7-2 **UNPACKING INSTRUCTIONS**

1. Open the box or crate labeled with the detector unit in it
2. Remove Packing
3. Remove Transit Case which is in a green bag with the detector unit and all other accessories which are contained inside.

7-2.1 **Detector Unit (DU).** The two ion mobility spectroscopy (IMS) cells in each detector unit (DU) contain americium-241, a source of alpha radiation (total per DU is 220 μCi). The IMS cells are potentially dangerous when opened or broken. The IMS cells should be removed from the DU and serviced only at the depot. If exposed to this radiation hazard, see your ship's medical officer and report the incident to your ship's safety officer.

7.3 **Packing**

CAUTION

Insure that the protective caps are installed in both the inlet and exhaust ports.

NOTE

Since the (SHIPBOARD ACADA) Detector Unit, contains Radioactive Material, the Radiological Protection (Safety) Officer (RPO/RSO) must be notified before shipment to ensure that all special requirements have been met i.e. radiation wipe test, marking, etc.

1. Wrap the detector in cushioning material to protect it from sock and vibration.
2. Place the wrapped Detector in a Transit case with the accessories required.(see figure 8-1)
3. Place the Transit case with the detector into a stronger outer shipping container
4. Make sure the shipping container has a sticker on it that says "RADIOACTIVE." Marking shall be at least 16-point type or 3/8 inch in height.

5. Apply cushioning or fiberboard dunnage as required to protect in inner Transit case container and its contents.
6. Close the container in a manner that will allow shipment without loss of the contents.

CHAPTER 8

REMOVAL AND RETURN PROCEDURE

8-1 INTRODUCTION.

This chapter contains the necessary information to remove and return the Shipboard Automatic Chemical Agent Detector and Alarm (Shipboard ACADA) and any of its components. Included in this chapter are packing, marking, and shipping and special instructions.

8-2 PACKING INSTRUCTIONS.

Packing is the reverse of unpacking. See Chapter 7 for instructions.

8-3 MARKING INSTRUCTIONS.

Mark each box in accordance with MIL-STD-129. For each Detector Unit (DU), the following statement shall be included on the outside of the packaging as well as on the shipping document:

> THIS PACKAGE CONFORMS TO THE CONDITIONS AND LIMITATIONS SPECIFIED IN 49 CFR 173.422 FOR EXCEPTED RADIOACTIVE MATERIAL, INSTRUMENTS AND ARTICLES, UN2910. IT IS EXCEPTED FROM MARKING AND LABELING REQUIREMENTS.

Table 8-1. Shipboard ACADA Removal Summary Checklist

Unit or Item	Quantit	Part Number	Serial Number	Check
Detector Unit Assembly	2	7243432		
Power Supply Assembly	4	7343940		
AC Power Cable	1	7343949		
DU power cable	1	7343948		
Confidence Sampler	1	NSN 6665-01-382-7081		
Manual	2	SW073-AF-MMO-010		

8-4 SHIPPING INSTRUCTIONS.

The Shipboard ACADA and any of its components must be shipped to:

COMMANDER
CODE 805D BLDG 3324
NAVSURFWARCENDIV
300 HIGHWAY 361
CRANE IN 47522-5001

The shipment must be by traceable means. Provide advance notice of shipment by email, message, phone or FAX to:

NAVSURFWARCENDIV CRANE
CODE 805D
Wagler_tory@crane.navy.mil, or clark_s@crane.navy.mil
PHONE: DSN 482-1052/4050
Commercial (812) 854-1052/4050
FAX: DSN 482-5828 or
Commercial (812) 854-5828

Include the document number, serial number of each component, if applicable, date shipped, shipping activity, and phone or FAX number.

APPENDIX A
ABBREVIATIONS AND ACRONYMS

AC	–	Alternating Current
ACADA	–	(Shipboard) Automatic Chemical Agent Detector and Alarm
A/D	–	Analog-to-Digital
Am^{241}	–	americium-241
BIT	–	Built-In-Test
BPL	–	Bituminous Product, Low Ash
CBR	–	Chemical, Biological, and Radiological
CDU	–	Control Display Unit
CPU	–	Central Processing Unit
DC	–	Direct Current
DCA	–	Damage Control Assistant
DPM	–	Dipropylene Glycol Monomethyl Ether
DU	–	Detector Unit
IMA	–	Intermediate Maintenance Activity
IMS	–	Ion Mobility Spectroscopy
ISEA	–	In-Service Engineering Activity
lpm	–	Liters per minute
MRC	–	Maintenance Requirement Card
ms	–	millisecond
□Ci	–	microcurie
NPFC	–	Naval Publications and Forms Center
NSN	–	National Stock Number
NSWSES	–	Naval Ship Weapon Systems Engineering Station
PC	–	Printed Circuit
PMS	–	Planned Maintenance System
RDU	–	Remote Display Unit
sec	–	seconds
WCS	–	Work Center Supervisor
VAC	–	Volts Alternating Current
VDC	–	Volts Direct Current

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	A	TDP TM OTHER X

. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A001	QUALITY SYSTEM PLAN	

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-QCIC-81449	3.2.9.1 and 3.2.9.4	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
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. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
A			SEE BLK 16

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE
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6. REMARKS:

LOCK 7 – Submit one info copy only of LT to: COMMANDER, CODE 1165 B-3291 TT M SIDDONS, NAVAL SURFACE WARFARE CENTER (NSWC) 300 HIGHWAY 361, RANE IN 47522-5001 or electronically to: siddons_marlene@crane.navy.mil

LOCK 8 - The Government will review the draft plan for technical dequacy and content IAW of the SOW. Written comments to be ncorporated into the final will be provided by the Government within 15 ays after receipt of the draft.

lock 9 – Distribution Statement C: Distribution Authorized to U.S. Government gencies and their contractors; Administrative/Operational use; OCT 1999. Other equests for this document shall be referred to Naval Sea Systems Command (SEA-05R1).

ESTRUCTION NOTICE. "For unclassified, limited documents, destroy by any ethod that will prevent disclosure of contents or reconstruction of the document.

LOCKS 12 AND 13 – Submit the draft 60 days after award of contract. Submit the inal within 20 days after receipt of Governent comments.

lock 14 – Addressee List (AL)

L-01 is DCMC

L-02
OMMANDER
ODE 805 BLDG 3324 ATT S CLARK
AVAL SURFACE WARFARE CENTER, CRANE
00 HIGHWAY 361
RANE IN, 47522-5001
r electronically to: clark_sandra@crane.navy.mil

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. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A002	CONTRACTOR'S CONFIGURATION MANAGEENT PLA	

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-CMAN-808058B	3.2.6	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	SEE BLK 16	OTIME	30 DAC
. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
A			15 DARC

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE
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LOCK 8 - Submit the draft plan 30 days after award. The Government ill review the draft for technical adequacy and in accordance with (IAW) he SOW. Written comments to be incorporated into the final plan will be rovided within 15 days after receipt of draft.

lock 9 - Distribution Statement C and DESTRUCTION NOTICE APPLIES.

Block 14 – Addressee List (AL)
L-01 is DCMC

L-02
OMMANDER
ODE 805 BLDG 3324 ATT S CLARK
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		Theresa Andis,	

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. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE	17. PRICE GROUP
A003	TEST PROCEDURE	First Article	

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE	18. ESTIMATED TOTAL PRICE
DI-RELI-80603	3.2.4.2	NSWC, CRANE, CODE 805D	INSERT IN SECT. B

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
DD	SEE BLK 16	OTIME	SEE BLK 16

. APP CODE	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
A		SEE BLK 16

6. REMARKS:

LOCK 8 - Submit the draft procedure within 60 days after award of contract. The overnment will review the draft for technical adequacy in accordace with (IAW) the equirements of the SOW. Written comments to be incorporated into the final will be rovided by the Government within 30 days after receipt of the draft procedure.

lock 9 - DISTRIBUTION STATEMENT C and DESTRUCTION NOTICE applies.

"BLOCKS 12 AND 13 – Submit the draft 60 days after award of contract, Submit the inal within 30 days after receipt of Government comments.

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. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A004	TEST PROCEDURE	Production

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-RELI-80603	3.2.4.2.3	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
DD	SEE BLK 16	OTIME	SEE BLK 16

. APP CODE	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
A		SEE BLK 16

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE
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6. REMARKS:

LOCK 8 - The Government will review the draft for technical adequacy in accordace ith (IAW) the requirements of the SOW. Written comments to be incorporated into he final will be provided by the Government within 15 days after receipt of the draft rocedure.

lock 9 - Distribution Statement C and DESTRUCTION NOTICE APPLIES.

LOCKS 12 AND 13 – Submit the draft 30 days after receipt of production uthorization. Submit the final within 15 days after receipt of Government omments.

lock 14 – Addressee List (AL)
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. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A005	TEST/INSPECTION REPORT	

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-NDTI-80809B	3.2.4.2	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
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. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
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17. PRICE GROUP

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lock 9 - Distribution Statement C and DESTRUCTION NOTICE APPLY: D

BLOCKS 12 AND 13 – Submit the report within 10 days after completion of the First rticle Unit testing. Submit the report concurrent with each delivery .

lock 14 – Addressee List (AL)
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L-01
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. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A006	CONFIGURATION AUDIT REPORT	PCA

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-CMAN-81022C	3.2.6	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	SEE BLK 16	OTIME	SEE BLK 16
. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
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17. PRICE GROUP

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lock 9 - Distribution Statement C and DESTRUCTION NOTICE APPLIES.:

LOCKS 12 AND 13 – Submit the report within 21 days after completion of the PCA.

Block 14 – Addressee List (AL)
L-01 is DCMAO

L-02
OMMANDER
ODE 805 BLDG 3324 ATT S CLARK
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. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A007	PROVISIONING TECHNICAL DOCUMENTATION	

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-ILSS-81285	3.2.8	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	SEE BLK 16	OTIME	60 DAC

. APP CODE	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
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lock 9 - Distribution Statement C and DESTRUCTION NOTICE APPLIES.:

lock 8 - The Government will review the draft manual for technical content and dequacy in accordance with the contract Sow / Specifications. Written comments o be incorporated into the final will be provided within 30 days after receipt of the raft.

LOCKS 12 AND 13 – Submit the draft 60 days after award. Submit the final 30 days fter receipt of Government comments.

Block 14 – Addressee List (AL)
L-01 is DCMC

L-02
OMMANDER
ODE 805 BLDG 3324 ATT S CLARK
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. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A008	RECOMMENDED SPARE PARTS LIST	

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-ILSS-80134A	3.2.8	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	SEE BLK 16	ASREQ	SEE BLK 16

. APP CODE	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
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LOCK 8 - Government will review the draft list IAW technical adequacy nd content. Written comments to be incorporated into the final will be rovided by the Government 15 days after receipt of the draft.

lock 9 - DISTRIBUTION STATEMENT C and DESTRUCTION NOTICE APPLIES.:

LOCKS 10 and 12. – Submit the list No Later Than (NLT) 30 days after ECP equirng a part change is appproved.

L-01 is DCMC

L-02
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. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A009	ENGINEERING CHANGE PROPOSAL (ECP)	

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-CMAN-80639C	3.2.9.2	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	SEE BLK 16	ASREQ	ASREQ

. APP CODE	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
A		ASREQ

17. PRICE GROUP

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6. REMARKS:

LOCK 4 - BLK 10 OF DATA ITEM DESCRIPTION. The ECP may be in contractor ormat. Content may use Appendix D of MIL-STD-973 and form DD 1692 as uidance.

LOCK 7 – Submit one info copy only of LT to: COMMANDER, CODE 1165 B-3291 TT M SIDDONS, NAVAL SURFACE WARFARE CENTER (NSWC) 300 HIGHWAY 361, RANE IN 47522-5001 or electronically to: siddons_marlene@crane.navy.mil

LOCK 8 - The Government will review the ECP for technical, impact, erit and classification of the request. Comments will be provided within 0 days after receipt of the ECP.

lock 9 - Distribution Statement C and DESTRUCTION NOTICE APPLIES.:

LOCKS 10, 12 AND 13 – Submit both Class I and Class II to the DCMC QAR for orwarding to NSWC CRANE CODE 805D for concurrence of Class II classification nd recommended approval/disapproval of Class I ECP. Concurrence of Class II ill be provided by the Government within 15 days after receipt of the ECP. pproval of Class I will be witihin 30 days after receipt of the ECP and will be rovided by the PCO.

Block 14 – Addressee List (AL)
L-01 is DCMAO

L-02
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00 HIGHWAY 361
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AL-01 – DCMC			1
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. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A010	REQUEST FOR DEVIATION (RFD)	

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-CMAN-80640C	3.2.9.2	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	SEE BLK 16	ASREQ	ASREQ

. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
A			ASREQ

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LOCK 8 - The Government will review the RFD for technical, impact on ost and scheduleu of the request. Comments will be provided within 30 ays after receipt of the RFD.

lock 9 - Distribution Statement C and DESTRUCTION NOTICE APPLIES.:

LOCKS 10, 12 AND 13 – Submit the RFD within 10 days after need is recognized r justifcation is available.

Block 14 – Addressee List (AL)
L-01 is DCMC

L-02
OMMANDER
ODE 805 BLDG 3324 ATT S CLARK
AVAL SURFACE WARFARE CENTER, CRANE
00 HIGHWAY 361
RANE IN, 47522-5001
r electronically to: clark_s@crane.navy.mil

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		Theresa Andis, Crane Data Manager	

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	A	TDP TM OTHER X

. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A011	REQUEST FOR WAIVER (RFW)	

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-CMAN-80641B	3.2.9.2	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	SEE BLK 16	ASREQ	ASREQ
. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
A			ASREQ

17. PRICE GROUP

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lock 9 - Distribution Statement C and DESTRUCTION NOTICE APPLIES.:

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Block 14 – Addressee List (AL)
L-01 is DCMC

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. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A012	NOTICE OF REVISION (NOR)	

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-CMAN-80642B	3.2.9.2	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	SEE BLK 16	ASREQ	ASREQ
. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
A			ASREQ

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE
INSERT IN SECT. B

6. REMARKS:

LOCK 4 - BLK 10 OF DATA ITEM DESCRIPTION. The RFW may be in contractor ormat. Content may use Appendix G of MIL-STD-973 as guidance.

LOCK 7 – Submit one info copy only of LT to: COMMANDER, CODE 1165 B-3291 TT M SIDDONS, NAVAL SURFACE WARFARE CENTER (NSWC) 300 HIGHWAY 361, RANE IN 47522-5001 or electronically to: siddons_marlene@crane.navy.mil

LOCK 8 - The Government will review the NOR for technical, content, mpact on cost and schedules. Comments will be provided within 30 days fter receipt of the NOR.

lock 9 - Distribution Statement C and DESTRUCTION NOTICE APPLIES.:

LOCKS 10, 12 AND 13 – Submit the NOR concurrently with ECP as supporting ocumentation.

Block 14 – Addressee List (AL)
L-01 is DCMC

L-02
OMMANDER
ODE 805 BLDG 3324 ATT S CLARK
AVAL SURFACE WARFARE CENTER, CRANE
00 HIGHWAY 361
RANE IN, 47522-5001
r electronically to: clark_s@crane.navy.mil

lectronic submissions shall be compatible with Windows 98 and in S Office applications or other format agreed upon at award.

14. DISTRIBUTION	b. COPIES		
a. ADDRESSEE	Draft	Final	
		Reg	Repro
AL-01 - DCMC			1
AL-02 - CODE 805D)			1
15. TOTAL			2

. PREPARED BY	DD. DATE	EE. APPROVED BY	J. DATE
		Theresa Andis, Crane Data Manager	

DD Form 1423-1, 1 Jun 90

CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
	A	TDP TM OTHER X

. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A013	FAILURE ANALYSIS AND CORRECTIVE ACTION REPORT	

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-RELI-81315	3.2.4.2	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	SEE BLK 16	ASREQ	SEE BLK 16

. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
			SEE BLK 16

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE
INSERT IN SECT. B

6. REMARKS:

lock 9 - **DISTRIBUTION STATEMENT C and DESTRUCTION NOTICE APPLIES.:**

LOCKS 12 AND 13 – Submit the report no later than(NLT) 10 days after each failure s experienced.

lock 14 – Addressee List (AL)
L-01 DCMC

L-02
OMMANDER
ODE 805 BLDG 3324 ATT S CLARK
AVAL SURFACE WARFARE CENTER, CRANE
00 HIGHWAY 361
RANE IN, 47522-5001
r electronically to: clark_s @crane.navy.mil

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AL-02 - CODE 805D)			1
15. TOTAL			2

. PREPARED BY	FF. DATE	GG. APPROVED BY	J. DATE
		Theresa Andis, Crane Data Manager	

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CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

Form Approved
OMB No. 0704-0188

. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
	A	TDP TM OTHER X

. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A014	CONFERENCE MINUTES	

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE: INSERT IN SECT. B

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-ADMN-81250A	3.2.9	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	SEE BLK 16	ASREQ	ASREQ
. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
			ASREQ

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
AL-01 - DCMC			1
AL-02 - CODE 805D)			1
15. TOTAL			2

6. REMARKS:

LOCK 7 – Submit one info copy only of LT to: COMMANDER, CODE 1165 B-3291 TT M SIDDONS, NAVAL SURFACE WARFARE CENTER (NSWC) 300 HIGHWAY 361, RANE IN 47522-5001 or electronically to: siddons_marlene@crane.navy.mil

lock 9 - Distribution Statement C and DESTRUCTION NOTICE APPLIES.:

LOCKS 10, 12 AND 13 – Submit the minutes within 2 days after onference/meetings

Block 14 – Addressee List (AL)
L-01 is DCMC

L-02
OMMANDER
ODE 805 BLDG 3324 ATT S CLARK
AVAL SURFACE WARFARE CENTER, CRANE
00 HIGHWAY 361
RANE IN, 47522-5001
r electronically to: clark_s @crane.navy.mil

lectronic submissions shall be compatible with Windows 98 and in S Office applications or other format agreed upon at award.

. PREPARED BY	HH. DATE	II. APPROVED BY	J. DATE
		Theresa Andis, Crane Data Manager	

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CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

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OMB No. 0704-0188

. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
	A	TDP TM OTHER X

. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A014	CONFERENCE MINUTES	

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE
INSERT IN SECT. B

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-ADMN-81250A	3.2.9	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	SEE BLK 16	ASREQ	ASREQ
. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
			ASREQ

14. DISTRIBUTION

a. ADDRESSEE	b. COPIES		
	Draft	Final	
		Reg	Repro
AL-01 - DCMC			1
AL-02 - CODE 805D)			1
15. TOTAL			2

6. REMARKS:

LOCK 7 – Submit one info copy only of LT to: COMMANDER, CODE 1165 B-3291 TT M SIDDONS, NAVAL SURFACE WARFARE CENTER (NSWC) 300 HIGHWAY 361, RANE IN 47522-5001 or electronically to: siddons_marlene@crane.navy.mil

lock 9 - Distribution Statement C and DESTRUCTION NOTICE APPLIES.:

LOCKS 10, 12 AND 13 – Submit the minutes within 2 days after onference/meetings

Block 14 – Addressee List (AL)
L-01 is DCMC

L-02
OMMANDER
ODE 805 BLDG 3324 ATT S CLARK
AVAL SURFACE WARFARE CENTER, CRANE
00 HIGHWAY 361
RANE IN, 47522-5001
r electronically to: clark_s @crane.navy.mil

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. PREPARED BY	JJ. DATE	KK. APPROVED BY	J. DATE
		Theresa Andis, Crane Data Manager	

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CONTRACT DATA REQUIREMENTS LIST
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. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
	A	TDP TM OTHER X

. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A015	CONFERENCE AGENDA	

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE
INSERT IN SECT. B

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-ADMN-81249A	3.2.9	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	SEE BLK 16	ASREQ	ASREQ
. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
			ASREQ

6. REMARKS:

LOCK 7 – Submit one info copy only of LT to: COMMANDER, CODE 1165 B-3291 TT M SIDDONS, NAVAL SURFACE WARFARE CENTER (NSWC) 300 HIGHWAY 361, RANE IN 47522-5001 or electronically to: siddons_marlene@crane.navy.mil

lock 9 - Distribution Statement C and DESTRUCTION NOTICE APPLIES.:

LOCKS 10, 12 AND 13 – Submit agenda via email no later than 2 days prior to heduled meetings.

Block 14 – Addressee List (AL)
L-01 is DCMC

L-02
OMMANDER
ODE 805 BLDG 3324 ATT S CLARK
AVAL SURFACE WARFARE CENTER, CRANE
00 HIGHWAY 361
RANE IN, 47522-5001
r electronically to: clark_s @crane.navy.mil

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AL-02 - CODE 805D)			1
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. PREPARED BY	LL. DATE	MM. APPROVED BY	J. DATE
		Theresa Andis, Crane Data Manager	

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CONTRACT DATA REQUIREMENTS LIST
(1 Data Item)

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OMB No. 0704-0188

. CONTRACT LINE ITEM NO.	B. EXHIBIT	C. CATEGORY:
	A	TDP TM OTHER X

. SYSTEM/ITEM	E. CONTRACT/PR NO.	F. CONTRACTOR

. DATA ITEM NO.	2. TITLE OF DATA ITEM	3. SUBTITLE
A016	CONTRACTOR'S PROGRES, STATUS AND MANAGEMENT REPORT	

17. PRICE GROUP

18. ESTIMATED TOTAL PRICE
INSERT IN SECT. B

. AUTHORITY *(Data Acquisition Document No.)*	5. CONTRACT REFERENCE	6. REQUIRING OFFICE
DI-MGMT-80227	3.2.9.5.1	NSWC, CRANE, CODE 805D

. DD 250 REQ	9.DIST STATEMENT REQUIRED	10. FREQUENCY	12. DATE OF FIRST SUBMISSION
LT	SEE BLK 16	MTHLY	45DAC

. APP CODE	11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION
	05	05DARP

6. REMARKS:

LOCK 7 – Submit one info copy only of LT to: COMMANDER, CODE 1165 B-3291 TT M SIDDONS, NAVAL SURFACE WARFARE CENTER (NSWC) 300 HIGHWAY 361, RANE IN 47522-5001 or electronically to: siddons_marlene@crane.navy.mil

lock 9 – Distribution Statement C and DESTRUCTION NOTICE APPLIES.:

L-01 is DCMC

L-02
OMMANDER
ODE 805 BLDG 3324 ATT S CLARK
AVAL SURFACE WARFARE CENTER, CRANE
00 HIGHWAY 361
RANE IN, 47522-5001
r electronically to: clark_s @crane.navy.mil

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a. ADDRESSEE	Draft	Final	
		Reg	Repro
AL-01 – DCMC			1
AL-02 - CODE 805D)			1
15. TOTAL			2

. PREPARED BY	NN. DATE	OO. APPROVED BY	J. DATE
		Theresa Andis, Crane Data Manager	

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