CHAPTER 4
SCHEDULED MAINTENANCE

4.1 INTRODUCTION.
Proper scheduling and performance of preventive maintenance actions reduces equipment failures and ensures efficient performance of the Self-Contained Breathing Apparatus (SCBA). This chapter outlines safety requirements, defines the maintenance concept, references the SCBA Planned Maintenance System (PMS), discusses reporting requirements, and provides general maintenance instructions relating to both scheduled and unscheduled (corrective) maintenance actions.

4.2 SCOPE.
The preventive maintenance requirements for the SCBA are addressed in this chapter to assist supervisors and maintenance personnel in planning, scheduling, and documenting maintenance actions. The information in this chapter supplements the SCBA PMS (paragraph 4.5) and is presented in the following sequence:
- Safety Requirements
- Maintenance Concepts
- PMS
- United States Navy (USN) Maintenance and Material Management (3-M) System Coverage and Problem Reporting
- General Maintenance Instructions.

4.3 SAFETY REQUIREMENTS.
Maintenance personnel shall read and thoroughly understand the safety precautions contained in this manual and the appropriate Maintenance Requirement Card (MRC) contained in the SCBA PMS before performing any maintenance on the SCBA. Forces afloat should also comply with Office of the Chief of Naval Operations Instruction (OPNAVINST) 5100.19, Navy Safety and Occupational Health (SOH) Program Manual for Forces Afloat, Vol I/II/III. Shore activities should comply with OPNAVINST 5100.23, Navy Safety and Occupational Health (SOH) Program Manual.

4.4 MAINTENANCE CONCEPTS.
The SCBA maintenance concept is based on the USN PMS, which classifies maintenance into two categories: scheduled and unscheduled.

4.4.1 Scheduled Maintenance. Scheduled maintenance primarily involves actions required to ensure reliable system operation and includes such actions as inspection, cleaning, lubrication, leak testing, and operational testing. Scheduled maintenance requirements are provided in the SCBA PMS (see paragraph 4.5) and are also integrated in the operating procedures located in Chapter 2 of this manual.

4.4.2 Unscheduled Maintenance. Unscheduled (corrective) maintenance includes actions required to locate equipment faults and to correct failures or performance degradations. Unscheduled maintenance actions include troubleshooting and parts replacements and are performed by maintenance technicians who are adequately trained in the appropriate service requirements. Unscheduled maintenance is covered in Chapter 5, Troubleshooting, and in Chapter 6, Corrective Maintenance.

4.5 PLANNED MAINTENANCE SYSTEM.
Table 4-1 lists the seven MRCs that govern the SCBA PMS. The MRCs are indexed and referenced on Maintenance Index Page (MIP) 5519/016, Compressed Air Breathing Apparatus (Scott® Air-Pak®). MIP 5519/016 provides a summary of the maintenance actions found on the MRCs, along with periodicity codes, personnel requirements, man-hours, and any related maintenance.
### Table 4-1. Maintenance Requirement Cards and Descriptions.

<table>
<thead>
<tr>
<th>Periodicity</th>
<th>Maintenance Requirement Card Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>W-1</td>
<td>Inspect Air Cylinder Pressure</td>
</tr>
<tr>
<td>M-1</td>
<td>Inspect Breathing Apparatus</td>
</tr>
<tr>
<td></td>
<td>Test Breathing Apparatus</td>
</tr>
<tr>
<td>Q-1</td>
<td>Review Air Cylinder Hydrostatic Test Date and Expiration Date</td>
</tr>
<tr>
<td>36M</td>
<td>Test First and Second Stage Regulators</td>
</tr>
<tr>
<td>R-1</td>
<td>Inspect Breathing Apparatus</td>
</tr>
<tr>
<td></td>
<td>Clean Breathing Apparatus</td>
</tr>
<tr>
<td></td>
<td>Stow Breathing Apparatus</td>
</tr>
<tr>
<td>R-2</td>
<td>Visually Inspect Air Cylinder</td>
</tr>
<tr>
<td></td>
<td>Refill Air Cylinder</td>
</tr>
<tr>
<td>U-1</td>
<td>Prepare Air Cylinder for Hydrostatic Test</td>
</tr>
</tbody>
</table>

#### 4.6 USN MAINTENANCE AND MATERIAL MANAGEMENT (3-M) SYSTEM COVERAGE AND PROBLEM REPORTING.

The provisions of the OPNAVINST 4790.4 series, *Ships’ Maintenance and Material Management (3-M) Manual*, apply to the SCBA. Accordingly, any problems or need for corrective maintenance arising from performance of the maintenance actions contained in the SCBA MRCs should be properly reported using OPNAV Form 4790/2K to ensure timely and accurate Maintenance Data System (MDS) documentation of SCBA performance in the Fleet. In addition to Fleet requirements, MDS input from Fleet units is used by the In-Service Engineering Agent (ISEA) to identify and correct problems within the system itself or the related documentation and provisioning, including Coordinated Shipboard Allowance List (COSAL) support. The ISEA may be contacted at Commander, Naval Surface Warfare Center Panama City Division, Attn: Code S14, 110 Vernon Avenue, Panama City Beach, FL 32407-7001.

#### 4.7 GENERAL MAINTENANCE INSTRUCTIONS.

**WARNING**

If in doubt about the serviceability of a part, replace it immediately. Worn or damaged parts shall be replaced with authorized replacement parts only. Component failure during operations may result in serious personal injury or death.

Do not disassemble components or loosen or tighten fittings while the system is pressurized. Prior to performing maintenance, ensure high-pressure air supply has been shut down and all pressure has been bled from the system. Exposure to escaping high-pressure air may result in serious personal injury or death.

#### 4.7.1 Equipment Disassembly and Parts Replacement.

Disassemble the equipment only to the extent necessary to perform the required maintenance action. Ensure all air is bled from the system and that proper tag-out procedures are performed prior to conducting maintenance. Once joints or connections have been opened, maintain cleanliness by capping or plugging all open ports, or by bagging all exposed components prior to performing maintenance.

If any component fails inspection or testing, replace the worn or damaged part with authorized replacement parts only (see parts lists in Chapter 7). Approved general cleaning procedures, leak detection compounds, and lubricants are listed in the following paragraphs along with general O-ring removal and replacement.
procedures. All the tools, parts, and materials used for maintenance are listed on the individual MRCs and are identified by their Standard PMS Materials Identification Guide (SPMIG) numbers.

**WARNING**

Cleanliness is imperative in handling and maintaining the SCBA. All tools and parts must be kept free of oil, grease, rust, or other contamination. Contamination of the breathing air system could result in serious personal injury or death.

Use of other than recommended cleaning agents may result in equipment failure and serious personal injury or death.

4.7.2 General Cleaning Procedure. Clean is defined as free of all loose scale, rust, grit, filings, dirt, oil, grease, and other foreign substances when viewed by the unaided eye. It is vitally important to keep the work area and parts clean during maintenance of breathing air systems and equipment. To avoid introducing contaminants or foreign particles into joints or connections that need to be opened for maintenance, clean the joints and connections (and the areas around them) with a soft bristle brush and cleaning solution prepared by mixing 1 teaspoon of MIL-D-16791, Type 1 Non-Ionic Detergent (NID) to one gallon of warm, fresh water. Rinse the cleaned parts with clean, fresh water and wipe dry with a clean cloth or air dry.

4.7.3 Leak Detection. The use of MIL-L-25567D, Type I leak-detection compound is preferred for leak testing all SCBA air system connections that were broken for maintenance. The NID solution mentioned in paragraph 4.7.2 may also be used for leak testing if necessary.

4.7.4 Lubricants. Only use lubricants authorized on appropriate MRCs. Apply lubricants sparingly.

4.7.5 O-Ring Removal and Installation. If possible, visually inspect O-rings without removing them to avoid unnecessary disassembly that may cause undue wear.

4.7.5.1 Inspection. Exposed O-rings which are not required to be removed shall be visually inspected for damage and replaced if necessary.

**CAUTION**

To avoid damage to O-ring groove, remove O-rings using fingers only or the appropriate tool from an O-ring extractor kit.

4.7.5.2 Removal. If an O-ring cannot be removed with fingers, use an O-ring installation/removal tool. Scratching the O-ring groove may cause leakage or premature seal failure. Unless otherwise directed, all removed O-rings shall be cut and discarded.

4.7.5.3 Installation. Strict cleanliness and proper lubrication are essential during O-ring installation. Ensure new O-rings are of the proper size and material. To ensure correct installation, observe the following:

a. Visually inspect new O-rings for deformities or compression set, hardening or brittleness, nicks or cuts, pits or blisters, or any other signs of damage. Cut and discard damaged O-rings and obtain new O-rings for replacement.

b. Ensure parts are clean throughout the installation procedure. Dirt, chips, or foreign particles in O-ring grooves can cause leakage or damage to O-rings.

c. Lubricate O-rings before assembly. Use only approved lubricants for O-rings. Apply lubricant sparingly; excess lubricant can foul other components.

d. Do not overstretcher O-rings during installation. To avoid O-ring damage, stretch only as needed for proper installation.

e. Ensure O-rings are not twisted in groove as twisting occurs easily during replacement of large O-rings with relatively small cross-sectional diameters.
f. Do not force O-rings over corners, threads, splines, ports, or other sharp edges. Use thimble, support, cone, or other device to prevent O-rings from contacting sharp edges of parts.

g. When reassembling Society of Automotive Engineers/Military Specification (SAE/MIL-SPEC) straight-thread connections, ensure O-rings are not pinched or exposed.

h. When reassembling components, apply closing force to produce straight, longitudinal movement. Rotating or twisting movements should be avoided to prevent bunching, cutting, or tearing of seals.