

SECTION III
CHAPTER 25
INDOOR RANGE
OPERATIONS AND MAINTENANCE



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THE RANGE SOURCE BOOK
National Rifle Association
Range Services
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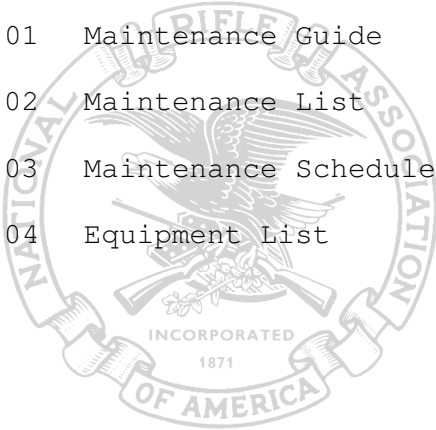
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ARTICLE 1. GENERAL

1.01 Purpose

In Section II, Chapter 10, guidelines were offered on how to establish an O&M (Operations and maintenance) guidebook. This chapter provides specific details on the organization of an operations and maintenance guidebook (including checklists) for an indoor range facility. This guidebook will help establish a step-by-step procedure to keep the facility operational. All ranges should establish a solid program of O&M based on a preventive, rather than a reactive, mode of operation.

ARTICLE 2. OPERATIONS

2.01 Operations Guide

Ranges should set up and use an operations guide. The guide should include a compilation of information needed to operate an indoor range successfully. Set up and tab each section in the guide (For ease of identification) and make copies for each of the officers or operators. The elements of an operations guide are referenced as:

- a) Organization Records
- b) Safety Plan
- c) Organization Structure
- d) Planning Guide
- e) Maintenance Guide
- f) Long Range Plan
- g) Sample Standard Operating Procedures

2.02 Operations Checklist

An operations checklist or guide together with training provides all users with the capability of running the facility when assigned operators are unavailable. An operations outline helps provide each user a complete detailed step-by-step operational procedure. The guide will detail who is responsible for keys, tools, range fixtures, whom to call for technical service, how to sign up new members, how to account for financial transactions, how to check in users or members either to shoot on a casual basis or in a tournament, how to turn on the lights, how to start the ventilation system, how to call the line for a tournament, and how to operate range equipment along with many other details. By providing a detailed checklist of things to do and conducting training sessions for users on how to use the checklist, the problems associated with range operation by people who are not familiar with such operations is made much easier.

The table of contents for the handbook should be laid out to cover the following items.

- a) Overview: The guidebook should begin with an overview of range operations, the range's purpose, who can use it and under what conditions it can be used.
- b) Operating procedures: Operating procedures detail who is in charge, how the facility is to be used, when it is to be used, maintenance schedules, record keeping, and who is authorized to do what.
- c) Range schedules: A calendar of events. This part of the guidebook requires constant revision as new activities are scheduled. A copy of this should be provided to all users.
- d) Appendix: The appendix should include all supporting documents and forms used during daily operation.



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ARTICLE 3. MAINTENANCE

3.01 Maintenance Guide

The maintenance guide may vary from as little as one page of information to a complete multi-page document filled with schematics, drawings, parts lists, maintenance requirements on lighting and ventilation systems, and guidelines for major equipment maintenance. Often this guide is developed during the planning, design, and construction of a project and includes a complete list of materials used in building the facility. It should document how the facility was designed and how it will be maintained, including information ranging from how to care for the lawn to how to remove and replace a target carrier or even the complete communications system. The elements are: (1) maintenance lists; (2) maintenance schedules; and (3) equipment lists.

3.02 Maintenance List

A maintenance list can be no more than a list of things to do, when to do it, and what is required for the record books after it has been done. An example would be:

- a) Dust removal from walls, floor, ceiling, inside ventilation ducts, light bulbs, equipment, etc.
- b) Removal of lead from the pit or backstop area
- c) Cleaning and replacement of lamps to maintain lighting levels at or near original levels
- d) Repairing steel plate surface areas and removal of lead build up
- e) Lubricating motors and the moving parts of return target mechanisms
- f) Lubricating and repairing turning target mechanisms
- g) Painting exterior surfaces of the building
- h) Roof repairs
- i) Cleaning windows

3.03 Maintenance Schedule

The maintenance checklist indicates when tasks are scheduled (due date) and may be done so as to take advantage of certain climatic conditions. For example, conducting a roof inspection may be done in the cooler months or just before the rainy season. Lighting systems should be inspected and new bulbs put into service just prior to the seasonal start up. Maintenance schedules show a list of each part of the facility, buildings, grounds, and equipment, with each broken down into its integral parts according to a prescribed time frame of maintenance.

Equipment maintenance schedules should show the piece of equipment and each job related to the maintenance program. One piece of equipment may have several jobs that must be performed during the year, identified according to a numbering sequence. For example, as the

chart below indicates, the first piece of equipment is a fan motor for the ventilation system, identified as number one with three different tasks required. As shown, there are spaces to list parts used, provide a description of the job/part, indicate if the job was scheduled or unscheduled, to show the frequency that routine maintenance should be performed and a date on which the work is completed. This list keeps the equipment maintenance up to date and as an inventory control unit.

Equipment Maintenance List

EQUIPMENT NO.	JOB NO.	PARTS	DESCRIPTION	SCHEDULED - UNSCHEDULED	FREQUENCY	DATE
Motor #1	1					
Lubrication	1a					
Drive Pulley	1b					
Drive Belts	1c					
Light Bank	2					
Ballast(s)	2a					
Bulbs/Tubes	2b					
Light Bank	3					
Ballast(s)	3a					
Bulbs/Tubes	3b					
Mechanism 1	4					
Cable	4a					
Motor	4b					

3.04 Equipment List

An equipment list consists of an inventory of all equipment needed to keep the facility functioning, and the list is broken down into equipment lists and parts lists.

a) Communications equipment, P.A. system, telephones:

- i. microphones
- ii. jacks
- iii. speakers
- iv. handsets
- v. cables
- vi. connectors
- vii. transformers
- viii. batteries

b) Turning and return mechanisms:

- i. grease fittings
- ii. cables
- iii. connector links
- iv. motors
- v. switches
- vi. remote control boxes
- vii. turning forks

c) Lighting systems:

- i. lamps
- ii. ballasts
- iii. ladders
- iv. dimming devices
- v. switches

d) Ventilation systems:

- i. ducts
- ii. motors
- iii. fan blades
- iv. drive belts
- v. exhaust vents
- vi. filters (with sizes)
- vii. controls safety check

Maintenance of Lighting Systems

Regular maintenance is the only way to ensure the effectiveness of any lighting system. Several factors contribute to decreased lighting:

- 1) luminaire (Lamp) ambient temperature
- 2) voltage to the (Lamp) luminaire
- 3) ballast factors
- 4) luminaire (Lamp) surface depreciation
- 5) room surface dirt depreciation

- 6) burnouts
- 7) lamp lumen depreciation
- 8) luminaire (Lamp) dirt depreciation

As air may be dirtier on an indoor range, lamps should be cleaned monthly. To maintain an effective lighting system, adopt the following procedures:

- 1) Change banks of lights regularly. Light output decreases as the lamps age.
- 2) Change lamps immediately on burnout. To allow burned out or blinking bulbs to remain in place is harmful to the life of the ballast system through overheating and expenditure of additional energy trying to restart the burned-out lamp.
- 3) Set up a cleaning program for lamps to remove dirt.
- 4) Maintain interior surfaces of fixtures by using vacuum cleaners and other cleaning materials to remove dirt and dust.
- 5) Arrange lighting fixtures so that ventilation in and around the fixture will serve to maintain lower temperatures. High temperature on the ballast and bulbs will greatly reduce life expectancy.

Periodic replacement of lamps and cleaning results in more light per dollar invested, better energy management.

Maintenance of Range Ventilation System

The range ventilation system will require maintenance similar to any ventilation system. The general system should be checked visually to insure that the ducts are stable with no bullet strikes and that there is no physical damage.

The motors on both the supply and exhaust should be lubricated every three months.

The fan blades should be checked annually to insure that they are clean and free from debris.

The fan belts should be checked every three months and changed annually.

The exhaust vents, back draft dampers, and louvers should be checked - and cleaned every six months.

The filters should be changed when they are at the manufacturers rated maximum pressure drop. Work with your installer or filter supplier to understand the limits of your filters and the proper time to change your filters. Dispose of your filters per EPA requirements. If there is any question if your filters required to be treated as hazardous materials, test the filter for lead content. The filters may also be recycled. Talk to your lead recycler.

Test your control safeties at least once per year to insure your range will not run if the range is positive to your base building.

Recommission your range at least every 3 years to insure proper air flow and operation.



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