

INDUSTRIAL VENTILATION

A Manual of Recommended Practice
*for Operation and
Maintenance*

2nd Edition



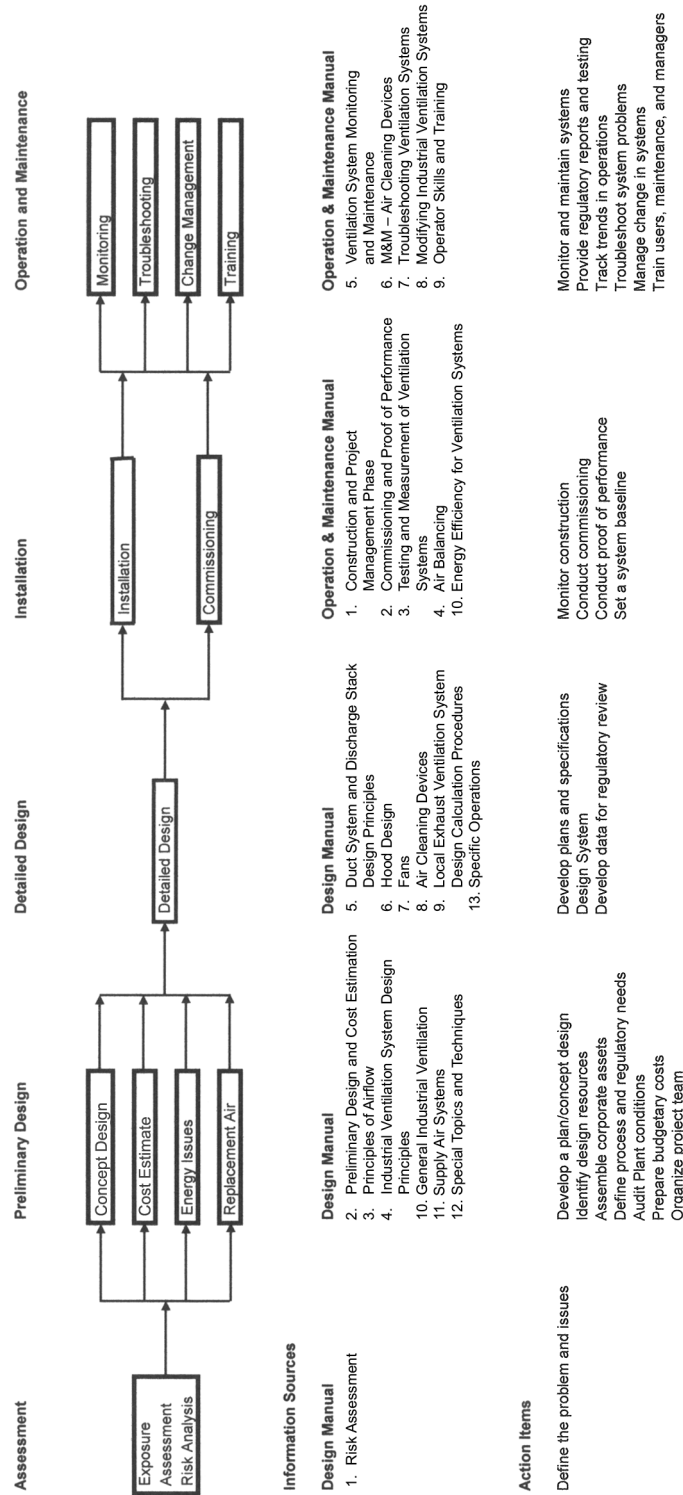
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LIFE CYCLE OF AN INDUSTRIAL VENTILATION SYSTEM



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Maintenance*

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CONTENTS

FOREWORDv
ACKNOWLEDGMENTSvii
DEFINITIONSix
ABBREVIATIONSxi
CHAPTER 1 CONSTRUCTION AND PROJECT MANAGEMENT PHASE	1-1
1.1 Introduction	1-2
1.2 Goals and Objectives During Construction	1-2
1.3 Project Team Organization and Responsibilities	1-4
1.4 Construction Documents	1-6
1.5 Project Scheduling	1-9
1.6 Managing Change and Avoiding Delays	1-10
1.7 Construction Reviews	1-12
1.8 Preparation for System Commissioning	1-19
1.9 Closeout Procedures and Responsibilities	1-20
REFERENCES	1-20
APPENDIX A1 SAFETY CONSIDERATIONS FOR CONSTRUCTION PROJECTS	1-24
APPENDIX B1 TRADE UNIONS IN VENTILATION PROJECTS	1-27
APPENDIX C1 CONSTRUCTION DRAWINGS	1-27
CHAPTER 2 COMMISSIONING AND PROOF OF PERFORMANCE	2-1
2.1 Introduction	2-2
2.2 Commissioning Team Organization	2-4
2.3 Components of the Commissioning Process	2-5
2.4 Forms and Documents	2-20
2.5 Proof of Performance	2-20
2.6 Training	2-25
2.7 Summary	2-25
REFERENCES	2-25
CHAPTER 3 TESTING AND MEASUREMENT OF VENTILATION SYSTEMS	3-1
3.1 Introduction	3-3
3.2 Computing Air Velocity and Airflow Rates	3-5
3.3 Representative Sampling for Pressures and Velocities	3-10
3.4 Static Pressure Measurements	3-16
3.5 Selection and Use of Instruments	3-17
3.6 Calibration	3-29
3.7 Practical Issues in Ventilation System Measurement	3-32
REFERENCES	3-34
CHAPTER 4 AIR BALANCING	4-1
4.1 Introduction	4-2
4.2 Flow Control Devices	4-2

4.3	Strategic Goals for Balancing	4-4
4.4	Initial Steps Prior to Balancing	4-6
4.5	Balancing Methods	4-9
	REFERENCES	4-13
CHAPTER 5	VENTILATION SYSTEM MONITORING AND MAINTENANCE	5-1
5.1	Introduction	5-2
5.2	Why Monitoring and Maintenance are Needed	5-2
5.3	The Value of Predictive Maintenance	5-5
5.4	Recommended Practice – Key Elements	5-6
5.5	Maintenance Risk Assessment Process	5-10
5.6	Technical Documentation – Baseline	5-12
5.7	System Monitoring Using Baseline Data	5-14
5.8	Ventilation System Program Management	5-16
	REFERENCES	5-16
CHAPTER 6	MONITORING AND MAINTENANCE – AIR CLEANING DEVICES	6-1
6.1	Introduction	6-3
6.2	Mechanical Collectors	6-3
6.3	Fabric Filters	6-5
6.4	Particulate Scrubbers	6-27
6.5	Absorber Scrubber Systems	6-33
6.6	Thermal and Catalytic Oxidizers	6-38
6.7	Vapor Adsorption Systems	6-45
6.8	Fiber Bed Filtration	6-50
6.9	Electrostatic Precipitation	6-56
6.10	Wet Electrostatic Precipitators	6-60
6.11	Bioscrubbers and Biofilters	6-68
	REFERENCES	6-74
CHAPTER 7	TROUBLESHOOTING VENTILATION SYSTEMS	7-1
7.1	Introduction	7-2
7.2	Evaluation of the Problem	7-2
7.3	System Walkthrough: Visual Observation and Assessment	7-5
7.4	Preliminary Measurement and Data Evaluation	7-5
7.5	Indications of System Performance Degradation	7-7
7.6	Selection of Troubleshooting Methods	7-7
7.7	Baseline Deviation Method	7-12
7.8	Pressure Ratio Methods	7-17
7.9	Troubleshooting When No Baseline Data Exist	7-19
7.10	Coefficient of Entry and Hood Flow Evaluations	7-22
7.11	Air Handling Unit Troubleshooting	7-25
7.12	Validation of Results	7-25
	REFERENCES	7-26
CHAPTER 8	MODIFYING INDUSTRIAL VENTILATION SYSTEMS	8-1
8.1	Introduction	8-2
8.2	Managing Industrial Ventilation Changes	8-2
8.3	Ventilation Change Review	8-3
8.4	Increasing or Decreasing the System Airflow Rate	8-4
8.5	Adding a Duct Branch	8-6

	8.6	Removing a Duct Branch	8-15
	8.7	Increase Opening on Enclosing Hood	8-16
	8.8	Moving a Hood in Relation to a Contaminant Source	8-17
		REFERENCES	8-18
CHAPTER 9		OPERATOR SKILLS AND TRAINING	9-1
	9.1	Introduction	9-2
	9.2	Functional Roles	9-2
	9.3	Skill Level 1: General Awareness	9-2
	9.4	Skill Level 2: System User	9-3
	9.5	Skill Level 3: Industrial Ventilation System Operators	9-3
	9.6	Skill Level 4: Industrial Ventilation System Troubleshooter	9-3
	9.7	Skill Level 5: Industrial Ventilation System Change Management	9-5
	9.8	System Operators Interface with Other Plant Personnel	9-5
	9.9	Developing Site-Specific Training Programs	9-6
	9.10	Local Exhaust Ventilation Fundamentals	9-7
CHAPTER 10		ENERGY EFFICIENCY FOR VENTILATION SYSTEMS	10-1
	10.1	Introduction	10-2
	10.2	Factors Affecting the Energy Efficiency of a Ventilation System	10-2
	10.3	Energy Efficiency Opportunities for Industrial Ventilation Systems	10-9
		REFERENCES	10-21
		ACKNOWLEDGMENTS	10-22
INDEX			11-1

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FOREWORD

Since its first edition in 1951, *Industrial Ventilation: A Manual of Recommended Practice for Design* (the Ventilation Manual) has been used by engineers, industrial hygienists and other practitioners to both design and evaluate/repair industrial ventilation systems. This Manual entitled *Industrial Ventilation: A Manual of Recommended Practice for Operation and Maintenance* (the O&M Manual) is written as a companion document to the Design Manual and is intended to complement its information. The Industrial Ventilation Committee has found a need in the public forum for further consideration of a number of burgeoning issues that would benefit practitioners of this art. Consequently, the two Manuals can be considered as a whole entity even while they will generally address different subjects.

To facilitate navigation between the two volumes, an insert on the front, inside cover shows how the chapters are related. The two Manuals are divided into several topics, which generally follow the timeline for the development of an industrial ventilation system.

- Concept Design
 - Risk Assessment – Design Manual – Chapter 1
 - Preliminary Design and Cost Estimation – Design Manual – Chapter 2
 - Special Topics and Techniques – Design Manual – Chapter 12
- Detailed Design
 - Principles of Airflow – Design Manual – Chapter 3
 - General Industrial Ventilation – Design Manual – Chapter 10
 - Duct System and Discharge Stack Design Principles – Design Manual – Chapter 5
 - Hood Design – Design Manual – Chapter 6
 - Fans – Design Manual – Chapter 7
 - Air Cleaning Devices – Design Manual – Chapter 8
 - Local Exhaust Ventilation System Design Calculation Procedures – Design Manual – Chapter 9
 - Supply Air Systems – Design Manual – Chapter 11
 - Specific Operations – Design Manual – Chapter 13
- Installation
 - Construction and Project Management Phase – O&M Manual – Chapter 1
- Commissioning
 - Commissioning and Proof of Performance – O&M Manual – Chapter 2
 - Testing and Measurement of Ventilation Systems – O&M Manual – Chapter 3
 - Air Balancing – O&M Manual – Chapter 4
- Monitoring and Maintenance of a Ventilation System
 - Ventilation System Monitoring and Maintenance – O&M Manual – Chapter 5
 - M&M – Air Cleaning Devices – O&M Manual – Chapter 6
 - Energy Efficiency for Ventilation Systems – O&M Manual – Chapter 10 (New chapter)
- Managing Ventilation Systems
 - Troubleshooting Ventilation Systems – O&M Manual – Chapter 7
 - Modifying Industrial Ventilation Systems – O&M Manual – Chapter 8
 - Operator Skills and Training – O&M Manual – Chapter 9

Information provided as a guideline can be influenced by other factors in an industrial environment (material handling techniques, cross-drafts and replacement air, work practices, and housekeeping, etc.), therefore formulae developed in the laboratory and at other sites may need to be altered further for actual field conditions. In many cases, ranges of values are shown, leaving final selection to be based on the experience of the practitioner and appropriate field conditions. Hence, the practitioner should always evaluate the effectiveness of hoods and other parts of the system after installation and be prepared to make changes as needed. Indeed, due to process changes, work-practice changes, and to the effects of the aging of the system, practitioners should continually evaluate and modify systems throughout their life cycles.

This Manual is intended to be used as a guide, not as an official standard. It is designed to present current information with

regard to the subject matter covered. It is distributed with the understanding that the Industrial Ventilation Committee and its members, collectively or individually, assume no responsibility for any inadvertent misinformation, for inadvertent omissions, or for the results in the use of this publication.

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Industrial Ventilation is a true Committee effort. It brings into focus useful practical ventilation data from all parts of the world in one source. The Committee membership of industrial ventilation engineers and industrial hygienists represents a diversity of experience and interests that ensures a well-rounded cooperative effort.

From the First Edition in 1951, this effort has been successful as witnessed by the acceptance of the “Ventilation Manual” throughout industry, by governmental agencies, and as a worldwide reference and text.

As indicated in the Foreword, we now have two volumes of the Manual; the Operation and Maintenance (O&M) Manual and the Design Manual. We are extremely grateful to the external contributors listed at the end of the Foreword for their con-

tributions to the sixth chapter of the O&M Manual.

We are also grateful for the faith and firm foundation provided by past Committees and members listed below. A special acknowledgment on this Manual is made to Ms. Rita Williams. Ms. Williams’ assistance as editor and in the production of this Manual has been invaluable for many years.

Many figures in Chapters 1, 5, 6, 7 and 9 of the O&M Manual are courtesy of The Procter & Gamble Company (P&G). To P&G and many other individuals and agencies who have made specific contributions and have provided support, suggestions, and constructive criticism, our special thanks.

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