TAB PROCEDURAL GUIDE

**SHEET METAL AND AIR CONDITIONING CONTRACTORS'
NATIONAL ASSOCIATION, INC.
www.smacna.org**

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FIRST EDITION — JUNE, 2003

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FOREWORD

The primary content of this procedural guide was taken from Chapters 12 through 16 of SMACNA's *HVAC Systems Testing, Adjusting & Balancing* – Third Edition. This was done to provide the experienced testing and balancing (TAB) technician a condensed version of the larger manual that can be used as an on-site procedural guide.

This abbreviated guide will provide any SMACNA contractor already familiar with mechanical system operation basics, with the information necessary to balance most heating, ventilation, and air conditioning (HVAC) systems. Chapters on both air- and water-side HVAC system adjusting and balancing are included.

Most of today's newest HVAC systems are being designed with many more individually controlled temperature zones to improve occupant comfort, and variable-speed fans and pumps are becoming more commonplace to provide the exact amount of heating and cooling system capacity necessary to minimize energy usage. New occupant air ventilation codes are much more restrictive, at the same time building envelopes are becoming much tighter. The combination of constantly changing HVAC flow rates and increased demand for fresh- and filtered-ventilation air for all occupants is placing much more emphasis on proper HVAC system operation and balancing.

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CHAPTER 1

INTRODUCTION

1.1 SCOPE

The scope of this procedural guide includes the basic elements that are required to conduct an on-site testing, adjusting, and balancing (TAB) service.

1.2 PURPOSE

This guide is intended to be used by a trained TAB technician as a touchstone to assure that the best procedures are employed in a logical, effective order when conducting TAB services. A trained TAB technician should already be:

- intimately familiar with the design approaches and equipment used in HVAC systems;
- well versed in the array of instruments that can be used to measure the conditions within each HVAC component; and
- capable of evaluating the design data against the actual operating data to fine tune the overall building's energy systems to work in concert with one another at the lowest practical energy consumption.

1.3 HOW TO USE THIS GUIDE

This publication is intended as a on-site working document that can be used as a guide, checklist, reference, or whatever method best suits an individual technician's style and approach to TAB work and problem solving.

The following tips are included for initial planning. These are taken from the SMACNA *HVAC Systems Testing, Adjusting & Balancing* manual and other sources.

a. Pre-planning TAB work includes making sure that all the necessary parties and individuals are onboard. The type of building and systems to be tested and a realistic evaluation of what skills the TAB technician possesses are key planning elements. Often, a controls specialist will be needed to operate the system for the TAB technician. The original equipment suppliers may be needed as a resource, at a minimum, but for complex systems a manufacturer's representative may be needed at the site. If the building has a facilities manager, this individual is typically the most important individual with which the on-site TAB technicians will work. They have a substantial vested interest in ongoing customer satisfaction—the actual end-use customers are the people who work or live in the building and their satisfaction will ultimately be the yardstick of success.

b. Occasionally, a system cannot be balanced or made to perform in accordance with the contract documents regardless of the number of balancing dampers or valves that can be installed. Competent TAB technicians should be prepared for this possibility and work with the appropriate individuals to formulate recommendations as part of the final report.

1.4 THE APPLICATION OF TAB

1.4.1 New Buildings

Testing, adjusting and balancing of all HVAC systems in a new building is needed to complete the installation and to make the systems perform as the designer intended.

Assuming that the system design and installation meets the comfort needs of the building occupants, good testing, adjusting, and balancing of the HVAC system provides occupant comfort with minimum energy input. This is extremely important in this era of rising energy costs.

It is also important to make sure all factory equipment start-up service has been completed before beginning any TAB work. Most specifications on new building construction usually requires a factory representative to be present during the initial start-up and adjustment of central boilers, chillers, large variable speed motor drives, and cooling towers. This initial equipment checkout is also usually required to activate the factory warranties and is not part of the TAB contractor's responsibility. After this initial start-up service has been completed, the TAB contractor should be informed that the systems are operating properly, that all safety interlocks and protective devices are functioning, and the systems are ready to be balanced.

The Testing, Adjusting, and Balancing or TAB phase of any building construction or renovation is intended to verify that all HVAC water and air flows and pressures meet the design intent and equipment manufacturer's operating requirements. It is rare to find an HVAC system of any size that will perform completely satisfactorily without the benefit of TAB work. This is why it is considered a "best practice" for the designer to specify that TAB work be part of the HVAC system installation.