

SCTE[®] | STANDARDS

Energy Management Subcommittee

SCTE STANDARD

SCTE 274 2021

**Cable Operator Critical Facility Air Containment
Operational Practice**

NOTICE

The Society of Cable Telecommunications Engineers (SCTE) Standards and Operational Practices (hereafter called “documents”) are intended to serve the public interest by providing specifications, test methods and procedures that promote uniformity of product, interoperability, interchangeability, best practices, and the long term reliability of broadband communications facilities. These documents shall not in any way preclude any member or non-member of SCTE from manufacturing or selling products not conforming to such documents, nor shall the existence of such standards preclude their voluntary use by those other than SCTE members.

SCTE assumes no obligations or liability whatsoever to any party who may adopt the documents. Such adopting party assumes all risks associated with adoption of these documents and accepts full responsibility for any damage and/or claims arising from the adoption of such documents.

NOTE: The user’s attention is called to the possibility that compliance with this document may require the use of an invention covered by patent rights. By publication of this document, no position is taken with respect to the validity of any such claim(s) or of any patent rights in connection therewith. If a patent holder has filed a statement of willingness to grant a license under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, then details may be obtained from the standards developer. SCTE shall not be responsible for identifying patents for which a license may be required or for conducting inquiries into the legal validity or scope of those patents that are brought to its attention.

Patent holders who believe that they hold patents which are essential to the implementation of this document have been requested to provide information about those patents and any related licensing terms and conditions. Any such declarations made before or after publication of this document are available on the SCTE web site at <https://scte.org>.

All Rights Reserved
© 2021 Society of Cable Telecommunications Engineers, Inc.
140 Philips Road
Exton, PA 19341

Document Types and Tags

Document Type: Operational Practice

Document Tags:

- | | | |
|--|------------------------------------|--|
| ☐ Test or Measurement | ☐ Checklist | ☒ Facility |
| ☐ Architecture or Framework | ☐ Metric | ☐ Access Network |
| ☒ Procedure, Process or Method | ☐ Cloud | ☐ Customer Premises |

Table of Contents

Title	Page Number
NOTICE.....	2
Document Types and Tags	3
Table of Contents	4
1. Introduction.....	5
1.1. Executive Summary	5
1.2. Scope	5
1.3. Benefits	5
1.4. Intended Audience	5
1.5. Areas for Further Investigation or to be Added in Future Versions.....	5
2. Normative References	5
2.1. SCTE References	6
2.2. Standards from Other Organizations	6
2.3. Published Materials	6
3. Informative References	6
3.1. SCTE References	6
3.2. Standards from Other Organizations	6
3.3. Published Materials	7
4. Compliance Notation	7
5. Abbreviations and Definitions.....	7
5.1. Abbreviations.....	7
5.2. Definitions.....	8
6. Air Flow Management	8
6.1. Air Containment	9
6.1.1. Improved Efficiency.....	9
6.1.2. Increased Capacity	9
6.1.3. Improved climate control	10
6.2. Airflow Containment: Applicability	10
6.3. Preparing for Containment.....	11
6.4. Where Not to Use Containment	12
6.5. Cold Aisle Containment.....	12
6.5.1. Issues with Cold Aisle Containment.....	12
6.6. Hot Aisle Containment	13
6.6.1. Benefits of Hot Aisle Containment	13
6.6.2. Issues with Hot Aisle Containment	14
7. Fire Detection and Suppression.....	14
8. Containment – Temperature Controlling and Monitoring Overview	14
8.1. Supply Air Temperature Control.....	14
9. Measuring Success of Containment	14

List of Tables

Title	Page Number
Figure 1 - Containment comparison - without containment (above, top) and with cold aisle containment (above, bottom)	9
Figure 2 - Partial Containment with top curtain.....	11
Figure 3 - Complete Containment.....	11

1. Introduction

1.1. Executive Summary

This operational practice will address how airflow containment can be an effective strategy leading to increased critical facility efficiency, availability, and energy reduction. Airflow containment is the practice of controlling the flow of air in one or more ways such as hot aisle/cold aisle rack arrangement or other means that will be discussed in this operational practice. This document will expand on the topic introduced in SCTE 219. Also, SCTE 253 provides background information on setpoint management where airflow containment will help optimize that setpoint practice.

1.2. Scope

This document will explore the various types of air containment: hot aisle, cold aisle, chimney cabinets (which are another method of hot aisle containment) and associated systems. It will provide guidance on which methods to use for various scenarios faced daily by cable operators, for both legacy sites and new building design.

1.3. Benefits

All cable operators, telco providers, and data center managers are faced with keeping their electronic equipment environments in strict compliance with acceptable temperature ranges according to industry standards, codes and Service Level Agreements (SLAs). In addition, as energy use becomes a primary social and business consideration, the efficiency of cooling systems has become a major area of focus. There are a variety of ways to achieve this compliance through air conditioning via mechanical cooling as well as free airside economization where geographically feasible.

The operational benefits of containment are improved efficiency, increased cooling capacity, and more homogeneous distribution of cold supply air to the intake or inlet of IT equipment. The results from these benefits are, respectively: lower energy consumption, fewer cooling units required, and more effective control of the space. This applies regardless of the type of containment, whether hot aisle or cold aisles are contained.

1.4. Intended Audience

Facility design engineers and facility managers

1.5. Areas for Further Investigation or to be Added in Future Versions

Beyond containment the topic of rear door heat exchangers to remove heat directly at the rack is in a separate category to be considered. Heat removal using liquid or immersion cooling are possible in the near future as air cooling reaches its limitations. Future development of a selection matrix of solutions and kW heat removal required.

2. Normative References

The following documents contain provisions which, through reference in this text, constitute provisions of this document. The editions indicated were valid at the time of subcommittee approval. All documents are subject to revision and, while parties to any agreement based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents might not be compatible with the referenced version.