

Rule 331

Best Available Control Technology Replacement Guidelines

1.0 Introduction

The purpose of this document is to provide guidance on meeting the Best Available Control Technology ("BACT") component replacement requirements of SBCAPCD Rule 331. This guidance provides a listing of acceptable "Candidate" BACT technology and performance standards, a process by which "Alternate" BACT technologies may be considered, and procedures for documenting BACT selection and installation.

These guidelines supersede those previously issued on January 18, 1994. It is the SBCAPCD's intent to review and revise the enclosed list of Candidate BACT technology and performance standards on a semi-annual basis. Users should therefore review the issuance date of these guidelines; if it is more than 6 months old, please contact the SBAPCD Rule 331 BACT Project Manager, or our SBCAPCD Webpage, to obtain a copy of the latest Candidate BACT list.

Rule 331 requires that certain leaking valves, connections, pump seals, compressor seals, and pressure relief devices be replaced with BACT. The specific Rule 331 requirements that trigger BACT replacements are:

Section D.4 (Recurrent Major Leakers): Component or component parts which incur 5 repair actions for major gas or liquid leaks within a continuous twelve month period shall be replaced with BACT equipment as determined by the District's New Source Review Rule.

Section E.1.b (Critical Component Leakers): All leaks from critical components shall be minimized within one-hour to the extent possible and replaced with BACT as determined in accordance with the District's New Source Review Rule during the next process shutdown or within twelve months, whichever is sooner.

When an operator is required by Rule 331 to replace a component with BACT, two options are available to identify the appropriate replacement equipment that will meet BACT technology and performance standards. These options are summarized below:

Option No. 1: Utilize Candidate BACT Technologies and Performance Standards

Use of listed Candidate BACT replacements is the most "streamlined" identification option available to operators. The operator should refer to the list of Candidate BACT replacements first, prior to considering any Alternate BACT technologies. The list and process for selecting Candidate BACT equipment is found in Section 2.0 of these guidelines. Candidate BACT technologies and performance standards represent "achieved-in-practice" BACT standards for the classes and categories of equipment subject to Rule 331.

Option No. 2: Utilize Alternate Technologies and Performance Standards

Any operator that cannot install Candidate BACT listed technology or performance standards, must

submit adequate information and obtain written approval from the SBCAPCD for any proposed Alternate BACT technique and performance standard prior to installation. The procedures in Section 3.0 of these Guidelines shall be followed for this process. Please be advised, Candidate BACT technologies and performance standards (see Section 2.0) must be utilized if it is technically feasible to do so. Any Alternate BACT technology must also be capable of meeting or exceeding the equivalent Section 2.0 listed technology's performance standards for the class of equipment, as those standards represent "achieved-in-practice" BACT performance.

2.0 Candidate Best Available Control Technology and Performance Standards

Please refer to Appendix 5.1 of these guidelines for a listing of Candidate BACT equipment technology and performance standards. Operators must install any Appendix 5.1 listed equipment unless it can be proven to the SBCAPCD that it is not technically or safely feasible to do so.

If an Appendix 5.1 Candidate BACT technology is selected for installation, the operator shall report and document Candidate BACT replacements as follows:

1. Within 30 days of the discovery of a component requiring BACT per Rule 331, complete the Rule 331 BACT Reporting Form *APCD-02A* and send it to the SBCAPCD offices. A copy of this form is attached to these guidelines in the Appendices (Appendix 5.2);
2. Once received, the SBCAPCD will review the proposed installation, sign off in the appropriate box on the *APCD-02A* form, and return it to the operator;
3. Once the BACT installation has been completed in accordance with Rule 331 timelines, the operator shall sign off and date the "*BACT Replacement Installation Completed*" block of the *APCD-02A* form. A copy of this signed form shall be sent to the SBCAPCD offices within 30 days of completing the BACT installation. The APCD will file this signed off form to your project file and return a copy to you for your files; and
4. Operators shall also complete an update to the facility Rule 331 I&M Plan within 30 days of BACT component installation. This update shall document the installed BACT technology and performance standard (such as any BACT-equivalent leak detection and repair threshold)

Any operator that permanently installs Candidate BACT technology from the Appendix 5.1 list in effect on the date the SBCAPCD is notified of its selection, will be considered to have installed BACT as required by either Section D.4 or E.1.b of Rule 331. Subsequent to installation, continued Rule 331 BACT compliance for the component will be based upon it meeting the associated BACT performance standards over the life of the facility.

As deemed necessary by SBCAPCD inspection staff, the operator may be directed to provide additional evidence of any BACT installation. Such evidence may include, but not necessarily be limited to: a) equipment purchase orders; b) completed work orders/receipts; or, c) actual physical inspections of the component.

3.0 Alternate Best Available Control Technologies and Performance Standards

In cases where the operator believes that none of the Candidate BACT technology and performance standards in Section 2.0 above are technically, safely, or otherwise (must specify) infeasible, the operator

shall follow the procedures of this section to identify Alternate BACT. These procedures require that each Alternate BACT technology and performance standard be reviewed by the SBCAPCD on a case-by-case basis to ensure that "achieved-in-practice" BACT performance is utilized for the class of equipment. The operator must complete the following process:

1. Within 30 days of the discovery of a component requiring BACT replacement per Rule 331, the operator shall complete the Rule 331 Alternate BACT Proposal Form *APCD-02B* (see Appendix 5.3) and submit it to the SBCAPCD offices;
2. The SBCAPCD will complete its review of proposed Alternate BACT technologies within 30 days of receipt. By this date, the SBCAPCD will notify the operator of either: a) its approval of the Alternate BACT by returning a signed-off *APCD-02B* form; b) a request for additional information to complete its review; or c) a denial of the proposed Alternate BACT;
3. Upon receipt of either a request for additional information, or a denial of the proposed Alternate BACT, the operator shall respond to such inquiries/findings within 30 days of receipt;
4. Upon receiving written SBCAPCD approval of the proposed Alternate BACT replacement(s), the operator shall complete its installation consistent with the timelines of Rule 331;
5. Once the BACT installation has been completed in accordance with Rule 331 timelines, the operator shall sign off and date the "*BACT Replacement Installation Completed*" block of the *APCD-02B* form. A copy of this signed form shall be sent to the SBCAPCD offices within 30 days of completing the BACT installation. The APCD will file this signed off form to your project file and return a copy to you for your files; and lastly,
6. Operators shall also complete an update to the facility Rule 331 I&M Plan within 30 days of BACT component installation. This update shall document the installed BACT technology and performance standard (such as any BACT-equivalent leak detection and repair threshold)

Any operator that permanently installs APCD-approved Alternate BACT technology will be considered to have installed BACT as required by either Section D.4 or E.1.b of Rule 331. Subsequent to installation, continued Rule 331 BACT compliance for the component will be based upon it meeting the associated BACT performance standards over the life of the facility.

As deemed necessary by SBCAPCD inspection staff, the operator may be directed to provide additional evidence of any BACT installation. Such evidence may include, but not necessarily be limited to: a) equipment purchase orders; b) completed work orders/receipts; or, c) actual physical inspections of the component.

4.0 BACT Installation Timelines

Rule 331, sections D.4 and E.1.b dictate the installation timelines for Rule 331 BACT replacements. Described below are some clarifications on these timelines based upon whether a "Candidate" or an "Alternate" BACT replacement is under consideration.

4.1 Candidate BACT Replacements

Because these guidelines contain SBCAPCD "pre-approved" Candidate BACT replacements, operators shall install such equipment (where technically, safely and otherwise feasible) at the next scheduled

process shutdown. Such installation is required even when such shutdown may be scheduled to occur within 30 days of the discovery that the Rule 331 BACT replacement is triggered for a component.

Operators may apply for variance relief from the APCD Hearing Board if Candidate BACT replacements cannot be made in accordance with Rule 331 timelines.

4.2 Alternate BACT Replacements

If a planned (i.e., scheduled) process shutdown occurs prior to the SBCAPCD completing a review of any Alternate BACT installation under Section 3.0 of this guideline, the operator shall not be required to implement BACT during that shutdown. However, in this case the operator shall:

- ⇒ make a good faith effort to repair the component and to minimize emissions until replacement with BACT can be made; and
- ⇒ replace the component with SBCAPCD approved BACT at the next scheduled shutdown, or no later than 12 months after the original component leak was detected, whichever occurs first.

Similar to Candidate BACT replacements, operators may apply for variance relief from the APCD Hearing Board if any SBCAPCD approved Alternate BACT replacement cannot be made in accordance with Rule 331 timelines.

5.0 **Appendices**

- 5.1 Candidate BACT Replacement Technologies and Performance Standards (Updated Semi-annually)
- 5.2 Candidate BACT Replacement Reporting Form– (APCD Form: *APCD-02A*)
- 5.3 Alternate BACT Replacement Proposal Form – (APCD Form: *APCD-02B*)

Appendix 5.1

Candidate BACT Replacement Technology and Performance Standards

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Component	Technology & Code #		Performance Standard
Valve Stem Seal (Leakless or Sealesse Designs)	• Bellows	CBV-1	LDAR ¹ : 100 ppmv THC
	• Diaphragm seal	CBV-2	
Valve Stem Seal (Low Emissions Packing Designs)	• Spring-loaded packing; expandable packing; graphite packing; PTE-coated packing	CBV-3	LDAR: 100 ppmv THC
	• Precision machine stem	CBV-4	
	• Sealant injection	CBV-5	
Compressor Seal (Reciprocating Drives)	• Vented to vapor recovery	CBC-1	LDAR: 100 ppmv THC
	• Elastomer bellows	CBC-2	
	• O-ring seals	CBC-3	
	• Dry-running secondary containment seals	CBC-4	
Compressor Seal (Rotary Drives)	• Vented to vapor recovery or closed vent ²	CBC-5	LDAR: 100 ppmv THC
	• Dual/tandem mechanical seals ³	CBC-6	
	• Leakless designs (e.g. magnetic drive)	CBC-7	
Pump Seal	• Vented to vapor recovery or closed vent ²	CBP-1	LDAR: 500 ppmv THC
	• Dual/tandem mechanical seals ³	CBP-2	
	• O-ring seals	CBP-3	
	• Dry-running secondary containment seals	CBP-4	
	• Leakless designs (e.g. magnetic drive)	CBP-5	
Pressure Relief Valves/Devices ("PRDs")	• Vented to vapor recovery or closed vent ²	CBPRD-1	PRDs that are not vented to vapor recovery or closed vent system are subject to LDAR: 100 ppmv THC
	• Equipped with rupture disk ⁴	CBPRD-2	
	• Soft-seat designs	CBPRD-3	
Flange Connections	• Welded	CBF-1	LDAR: 100 ppmv THC
	• New gasket rated to 150% of process pressure at process temperature	CBF-2	
Other ⁵	• Welded	CBO-1	LDAR: 100 ppmv THC
	• New gasket rated to 150% of process pressure at process temperature	CBO-2	

¹ See Appendix 5.1, page 2.

² See Appendix 5.1, page 2

³ See Appendix 5.1, page 2.

⁴ See Appendix 5.1, page 2.

⁵ See Appendix 5.1, page 2.

Appendix 5.1
Candidate BACT Replacement Technology and Performance Standards

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Appendix 5.1 Table Footnotes

- 1 In this Appendix 5.1 table, LDAR means "Leak Detection and Repair." Repair actions consistent with Rule 331 timing requirements are required to a BACT component if the measured fugitive emission concentration (per Rule 331, §H.1 methods) at the subject leak-path exceeds the LDAR specifications in this Table. Note, the soap screening method of §H.1 cannot be used as it does not meet BACT requirements.
- 2 A "closed vent system" must route vapors to a control device such as a thermal oxidizer or flare.
- 3 These seals must be equipped with a barrier fluid system that operates either at a pressure greater than the pump or compressor discharge pressure, or is vented to a vapor recovery system.
- 4 Rupture disk equipped PRDs must be equipped with an integrity indicator system. Please supply additional information with any proposed rupture disk BACT system to describe how this integrity indicator system functions.
- 5 Component leak paths falling in the "other" Category means anything that does not clearly fit in the valve, compressor, pump, PRD or flange categories described above. "Other" components include the following:
 - Grease fittings
 - Threaded connections
 - Screwed couplings
 - Hatches
 - Meters
 - Sight Glasses
 - Level gauges
 - Diaphragms
 - Piping clamps

For information tracking purposes, operators are requested to include a short description of the "other" component type in field #8 when completing the *Candidate BACT Replacement Reporting Form* APCD-02.

Appendix 5.2
Rule 331 Candidate BACT Replacement
Reporting Form

APCD Form: APCD-02A

Rule 331 Candidate BACT Replacement Reporting Form

APCD Form: APCD-02A

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This form shall be used to document the proposed installation of Candidate BACT replacement technology identified in Appendix 5.1 of the Rule 331 BACT Guidelines document, when triggered by Rule 331 sections D.4, or E.1.b.

Item #	Item Description	Data or Information		
1	Date			
2	Company Name			
3	Permit Type & Number <small>(e.g. ATC xxxx)</small>			
4	Facility/Stationary Source Name			
5	Form Completed By (whom) & Phone #			
6	Rule 331 I&M Plan, Leak-Path ID Number			
7	Date BACT Replacement Triggered			
8	Leak –Path Type <small>(e.g., valve, flange, pump, compressor seal & others)</small>			
9	Service <small>(gas/light oil, oil, heavy oil)</small>			
10	Rule 331.C.3 Component Class <small>(major, minor, critical)</small>			
11	Rule 331 BACT Replacement Triggered by Rule 331, Section #: <small>(✓ box that applies)</small>	<input type="checkbox"/> §D.4 (recurrent repair to major leaker) <input type="checkbox"/> §E.1.b (critical component)		
12	Candidate BACT Replacement Technology Code Number Installed (see Appendix 5.1) & Applicable LDAR for I&M	<u>Code #</u>	<u>LDAR</u>	
13	BACT Equipment Make, Model Number, and other identifying information. <small>(attach vendor or other information if warranted)</small>			
14	Estimated Installation Cost (\$) <small>(material/installation labor/total)</small>	<u>Mtl.</u>	<u>Ins Lbr</u>	<u>Total</u>
15	Proposed Installation Date			

SBCAPCD Approval by: _____	Date: _____
BACT Replacement Installed on: _____	
Signed: _____	Print Name: _____
NOTE: within 30 days of replacement installation return this signed form to the SBCAPCD offices.	

Appendix 5.3
Rule 331 Alternate BACT
Replacement Proposal Form

APCD Form: APCD-02B

Rule 331 Alternate BACT Replacement Proposal Form

APCD Form: APCD-02B

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This form and all required supporting information must be submitted to the SBCAPCD to obtain authorization from the SBCAPCD for installation of Alternate BACT in accordance with Rule 331.D.4 or E.1.b BACT replacement requirements. Alternate BACT installations will be considered by the SBCAPCD on a case-by-case basis where Candidate BACT technology already identified in a published list cannot technically, safely, or otherwise reasonably be installed. A separate form must be completed for each separate "leak-path" being reviewed.

Item #	Item Description	Data or Information		
1	Date			
2	Company Name			
3	Permit Type & Number (e.g. ATC xxxx)			
4	Facility/Stationary Source Name			
5	Form Completed By (whom) & Phone #			
6	Rule 331 I&M Plan, Leak-Path ID Number			
7	Date BACT Replacement Triggered			
8	Leak -Path Type (e.g., valve, flange, pump, compressor seal & others)			
9	Service (gas/light oil, oil, heavy oil)			
10	Rule 331.C.3 Component Class (major, minor, critical)			
11	Rule 331 BACT Replacement Triggered by Rule 331, Section #: (<input checked="" type="checkbox"/> box that applies)	<input type="checkbox"/>	§D.4 (recurrent repair to major leaker)	
		<input type="checkbox"/>	§E.1.b (critical component)	
12	Alternate BACT Equipment Make, Model Number, and other identifying information. (attach vendor or other information if warranted)			
13	Estimated Installation Cost (\$) (material/installation labor/total)	<u>Mtl.</u>	<u>Ins Lbr</u>	<u>Total</u>
14	Proposed Installation Date			
15	Go to Page 2 of this form and justify the need for and provide details on the proposed installation of Alternate BACT.			

SBCAPCD Approval by: _____	Date: _____
BACT Replacement Installed on: _____	
Signed: _____	Print Name: _____
<i>NOTE: within 30 days of replacement installation return this signed form to the SBCAPCD offices.</i>	

Rule 331 Alternate BACT Replacement Proposal Form

APCD Form: APCD-02B

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Please answer the following questions in regards to the proposed Alternate BACT replacement (use separate paper if needed):

1. Describe why Rule 331 Candidate BACT replacement technology and performance standards (see Appendix 5.1) cannot be installed? Is it technically infeasible, unsafe, or otherwise infeasible?

2. Describe the proposed Alternate BACT technology:

3. Will Rule 331.H.1 prescribed OVA-based THC measurement techniques (excepting soap screening) be utilized to verify the leakage rate from this Alternate BACT equipment performance?
 Yes No If no, detail why not, and what is proposed for use on separate paper.

4. What is the proposed Leak Detection and Repair ("LDAR") threshold, if Rule 331.H.1 OVA inspection techniques are used:

_____ ppmv THC as methane

1. BACT Selection Process: How was this proposed Alternate BACT replacement selected (✓ one):

- Discussions with SBCAPCD staff: _____ on: _____
 Reviewed CAPCOA, or EPA BACT databases. BACT ID#: _____
 Vendor or Manufacturer recommendation (please attach all pertinent information)
 Other (please describe fully on separate pages)

6. BACT Effectiveness: Usually BACT is effective over all operating ranges and process throughputs for equipment that emit fugitive emissions. Check (✓) the appropriate response below:

- Yes, the proposed Alternate BACT replacement will be effective in all operations.
 No, the proposed Alternate BACT will not be effective in certain operations scenarios (describe all and why on separate pages).

7. Operating Constraints: Identify all process variable for which operating limits need to be set to ensure compliance with the proposed Alternate BACT performance standard.

Rule 331 BACT Guidelines Revision Summary

Version	Date	Reason for Changes
1.0	1/18/94	Initial version.
2.0	7/24/98	Guidelines updated to reflect performance based standards, and more streamlined identification and installation documentation process.
2.1	3/17/99	Semi-annual review and update to guidelines. Several typographical errors were corrected. No changes to the Appendix 5.1, Candidate BACT listed technology were identified. Note: Users may use either the Revision 2.0 or 2.1 guidelines until a future revision indicates otherwise.