T10/04-242r1

Voting Results on T10 Letter Ballot 04-241r0 on
Forwarding SBC-2 to First Public Review
Ballot closed: 2004/08/24 12:00 noon MDT

Organization	Name	S	Vote	Add'l Info
Adaptec, Inc.	Tim Symons	P	Yes	
Agilent Technologies	Pat Thaler	P	No	Cmnts
Amphenol Interconnect	Michael Wingard	P	Yes	
Brocade	Robert Snively	P	No	Cmnts
Cisco Systems, Inc.	Claudio DeSanti	P	Yes	
CNT	David Peterson	P	Yes	
Crossroads Systems, Inc.	Dexter Anderson	P	Yes	
Dallas Semiconductor	James A. Lott, Jr.	P	Yes	
Dell, Inc.	Kevin Marks	P	Yes	
EMC Corp.	Gary S. Robinson	P	Yes	
Emulex	Robert H. Nixon	P	Yes	Cmnts
ENDL	Ralph O. Weber	P	No	Cmnts
FCI	Douglas Wagner	P	Yes	
Foxconn Electronics	Elwood Parsons	P	Abs	Cmnts
Fujitsu	Mike Fitzpatrick	P	Yes	
General Dynamics			DNV	
Hewlett Packard Co.	Rob Elliott	P	Yes	Cmnts
Hitachi Cable Manchester			DNV	
Hitachi Global Storage Tech.	Dan Colegrove	P	Yes	
IBM Corp.	George O. Penokie	P	No	Cmnts
Intel Corp.	Robert Sheffield	P	Yes	
Iomega Corp.	David Hawks	P	Abs	Cmnts
LSI Logic Corp.	John Lohmeyer	P	Yes	Cmnts
Maxtor Corp.	Mark Evans	P	No	Cmnts
Microsoft Corp.	Emily Hill	P	Yes	Cmnts
Molex Inc.	Jay Neer	P	Yes	
Panasonic Technologies, Inc	Terence J. Nelson	P	Yes	
Philips Electronics			DNV	
Pivot3, Inc.	Bill Galloway	P	Yes	
PMC-Sierra	Rachelle Trent	P	Yes	
QLogic Corp.			DNV	
Quantum Corp.	Jim Jones	A	Abs	Cmnts
Seagate Technology	Gerald Houlder	P	No	Cmnts
Storage Technology Corp.	Erich Oetting	P	Yes	
Sun Microsystems, Inc.	Vit Novak	P	Yes	Cmnts
Texas Instruments	Paul D. Aloisi	P	Yes	
Toshiba	Yutaka Arakawa	P	Yes	
Tyco Electronics	Ashlie Fan	P	Abs	Cmnts
UNISYS	Ron Mathews	P	Yes	
Veritas Software	Roger Cummings	P	Yes	

Ballot totals: (26:6:4:4=40)
 26 Yes
  6 No
  4 Abstain
  4 Organization(s) did not vote
 40 Total voting organizations
 15 Ballot(s) included comments

This 2/3rds majority ballot passed.
26 Yes are more than half the membership eligible to vote minus abstentions
  [greater than 18] AND
26 Yes are at least 22 (2/3rds of those voting, excluding abstentions [32]) AND
26 Yes are equal to or exceed a quorum [13]

Key:
P   Voter is principal member
A   Voter is alternate member
Abs   Abstain vote
DNV   Organization did not vote
Cmnts   Comments were included with ballot
NoCmnts No comments were included with a vote that requires comments

****

Comments attached to No ballot from Pat Thaler of
Agilent Technologies:

4.15.3.2 top of page 28: It is technically incorrect dictate the
number of
bits that the CRC generator processes at one time. I can
get the same CRC
result with a pure serial generator or processing
any number of bits at a
time. It is not clear whether this text is
stating a requirement or merely
giving an example.

I also object to the use of "word" here as equivalent to two bytes.
I don't
see any definition of "word" here or in SAM 2. Industry
usage on the size of
a "word" varies.

The Figure 3 diagram indicates that an on byte size user field is
to be
padded out, but that is not indicated in any requirements
text and the Figure
is an example. This will cause
incompatabilities as some will pad for the
calculation and some
will not follow that example.

****

Comments attached to No ballot from Robert Snively of
Brocade:

1 (E) Page: xx Location: Introduction

Problem Description:
"which" s/b "that"

Suggested Solution:
Make requested correction

2 (E) Page: 6 Location: 3.1.20

Problem Description:
"A target action in response to a reset event in which the target port
performs the operations described in SAM-3." s/b "A target action in
response to a reset event that causes the target port to perform the
"hard reset" actions described in SAM-3"

Suggested Solution:
Make the requested correction

Make a similar correction in 3.1.24

3 (E) Page: 10 Location: 4.2

Problem Description:
"which" s/b "that"
In addition, the text should clarify that it is the logical block
address that is 4 or 8 bytes in length by adding the text "in length" at
the end of the same sentence.

Suggested Solution:
Make requested correction

5 (E) Page: 12 Location: 4.8

Problem Description:

"defects, which may be supplied by the original manufacturer of the device or medium, that" s/b "defects (supplied by the original manufacturer of the device or medium) that"

Suggested Solution:
Make requested correction

6 (E) Page: 21 Location: 4.13.1.4

Problem Description:
"which" s/b "that"

Suggested Solution:
Make requested correction

7 (E) Page: 26 Location: 4.15.3.1

Problem Description:
In table 7, for the R(X) row, the text "The remainder polynomial, which is of degree less than 16." s/b "The remainder polynomial. The polynomial shall be of degree less than 16."

Suggested Solution:
Make the requested correction

Note that this restriction on the polynomial might better be stated in the text.

The same correction needs to be made for P(X).

8 (E) Page: 35 Location: 5.4.1

Problem Description:
Rewrite the "which" clause to avoid it.

Suggested Solution:
Make requested correction

9 (E) Page: 38 Location: 5.4.2.2

Problem Description:
"header, which" s/b "header that"

Suggested Solution:
Make the requested correction

A similar change needs to be made just above Table 17.

10 (E) Page: 46 Location: 5.7

Problem Description:
"The GROUP NUMBER field specifies the group into which attributes associated with the command should be collected" s/b "The GROUP NUMBER field specifies the group that collects the attributes associated with the command."

Suggested Solution:
Make requested correction

11 (E) Page: 48 Location: 5.9

Problem Description:
"which may address" s/b "that is capable of addressing".

Suggested Solution:
Make requested correction

12 (E) Page: 65 Location: 5.21

Problem Description:
"It is not an error to specify that the logical unit transition to a

power condition in which it currently is." s/b "It is not an error to specify that the logical unit transition to its current power condition".

Suggested Solution:
Make requested correction

13 (E) Page: 95 Location: 5.44

Problem Description:
"The LOGICAL BLOCK ADDRESS field specifies the starting LBA of the data on which an XOR operation shall be performed with the data from the medium." s/b "The LOGICAL BLOCK ADDRESS field specifies the starting LBA of the data that shall be XOR'd with the data from the medium."

Suggested Solution:
Make the requested correction

A similar change needs to be made in the next paragraph for TRANSFER LENGTH.

14 (E) Page: 109 Location: 6.3.2.2

Problem Description:
"To determine the number of blocks at which the logical unit is currently formatted the application client shall use the READ CAPACITY command" s/b "The READ CAPACITY command shall be used to determine the number of blocks currently formatted on the logical unit."

Suggested Solution:
Make the requested correction.

A similar change is required in the last sentence of the sub-clause.

A similar change is required in the last sentence of the first paragraph on page 111

A similar change is required in the last sentence of the last paragraph on page 111

15 (E) Page: 109 Location: 6.3.2.2

Problem Description:
"On a MODE SENSE command, the NUMBER OF BLOCKS field indicates the number of logical blocks on the medium to which the BLOCK LENGTH field applies." s/b "On a MODE SENSE command, the NUMBER OF BLOCKS field indicates the number of logical blocks on the medium having the length specified by the BLOCK LENGTH field."

Suggested Solution:
Make the requested correction.

A similar change is required in the second paragraph on page 111.

16 (E) Page: 114 Location: 6.3.3

Problem Description:
"The NUMBER OF CACHE SEGMENTS field specifies the number of segments into which the device server shall
divide the cache." s/b "The NUMBER OF CACHE SEGMENTS field specifies the number of segments that the device server shall divide the cache into."

Suggested Solution:
Make requested correction

17 (E) Page: 5 Location: 3.1.4

Problem Description:
The definition of byte is inconsistent among the different standards. I have no particular objection to the present definition except that it does not consider the boundarie alignment requirement for the eight

contiguous bits.

Suggested Solution:
I would suggest changing this (and SAM and SPC) to read:
"A sequence of eight contiguous bits considered as a unit and aligned on character boundary".

18 (E) Page: 5 Location: 3.1.x

Problem Description:
Several references are missing.

Suggested Solution:
Add "See SAM-3" to:
3.1.10, 3.1.11, 3.1.15,

Add "See SPC-3" to:
3.1.14,

19 (E) Page: 5 Location: 3.1.9

Problem Description:
Abbreviations are included in the definitions sections. Include DLIST, GLIST, CLIST, and PLIST in clause 3.2 only. Do not define them except in the body of the referenced text.

Suggested Solution:
Make requested correction

20 (T) Page: 5 Location: 3.1.16

Problem Description:
XOR is incorrectly defined. I would propose that the following definition be used:
"The exclusive-OR function defined for binary arithmetic and logic. The output value is 1 if one and only one of the input values is 1. In this document, the exclusive-OR function is used to describe the operation that creates an output string of bits of length "n" by setting the "i"th bit of the string equal to the logical XOR of the "i"th bit of each of two input strings of bits, also of length "n". By extension, the term is used as an adjective to describe commands that perform this exclusive-OR function. Such operations can be used to create data redundancy that allows recovery of damaged data under certain conditions."

Suggested Solution:
Make the requested correction.

Note that the wording about "does not define the specific polynomial" is false. It must and does define the behavior of the device during execution of the XOR commands.

21 (T) Page: 6 Location: 3.1.26

Problem Description:
To use this word, you must also define the word "medium". I believe the intent is allow 3.1.38 and others to implicitly define that. However, the wording used in 3.1.28 is precisely the wording used for "medium" in SPC-3. I would propose changing 3.1.28 using the definition from SPC-3 and realphabetizing the item. That wording is:
"medium: A physical entity that stores data in a nonvolatile manner (retained through a power cycle) in
accordance with commands processed by the device server."

Suggested Solution:
Make the requested correction.

Note that the word "non-volatile medium" is used only one place in the whole document and its meaning is clear there.

Note that the word "volatile medium" is used only one place in the whole

document, and it refers to no device of which I am aware. I believe it should be deleted conceptually.

22 (T) Page: 6 Location: 3.1.29

Problem Description:
Use the text from SPC-3 instead of this text.

Suggested Solution:
Make requested correction

23 (T) Page: 6 Location: 3.1.30

Problem Description:
Use the text from SPC-3 instead of this text.

Suggested Solution:
Make requested correction

24 (T) Page: 6 Location: 3.1.33

Problem Description:
Change the definition to: "Medium containing data that cannot be changed by a SCSI command. The data is applied to the medium by methods outside the scope of this standard"

Suggested Solution:
Make requested correction

25 (T) Page: 6 Location: 3.1.35

Problem Description:
Replace the definition of "reset event" with the definition from SAM-3

Suggested Solution:
Make requested correction

26 (T) Page: 6 Location: 3.1.36

Problem Description:
Replace the definition of "sense data" with the definition from SPC-3.

Suggested Solution:
Make requested correction

27 (T) Page: 7 Location: 3.1.41

Problem Description:
Remove this definition. It only applies to two usages, both considered only because they are rendered obsolete. All other usages of the term do not keep older generations of data, but refer to updates of less than a complete stripe of data and can be considered a normal English use of the term.

Suggested Solution:
Make requested correction

28 (T) Page: 7 Location: 3.1.44

Problem Description:
Remove this definition. It is inconsistent with the SPC definition of medium. What is being referred to as a medium is really a storage area for parameters outside the medium.

Suggested Solution:
Make requested correction

29 (E) Page: 3 Location: 2.1, Table 1

Problem Description:
Remove all those not referenced in this document. For all practical

purposes, the only ones referenced are ISO, IEC, INCITS, and maybe ANSI, since there is only one approved reference and 5 approved references under development

Suggested Solution:
Make requested correction

30 (E) Page: 7 Location: 3.2

Problem Description:
Remove unreferenced abbreviations kbit and Mbit (which are defined incorrectly anyway).

Suggested Solution:
Make requested correction

31 (E) Page: 10 Location: 4.1

Problem Description:
Delete "and may be a multiple of 512 bytes", since it adds no information.

Suggested Solution:
Make requested correction

32 (T) Page: 10 Location: 4.1

Problem Description:
Delete "and additional information". There is no other SCSI-visible source of additional information, so it should not be mentioned.

Suggested Solution:
Make the requested correction.

The same correction must be made on page 11, clause 4.4, next to last paragraph, last sentence

33 (T) Page: 10 Location: 4.2

Problem Description:
The text concerning volatility is not correct. There is no volatile media device defined. There are devices with non-volatile caches, but the medium by definition is non-volatile.

Suggested Solution:
Delete second sentence of last paragraph.

34 (T) Page: 10 Location: 4.2

Problem Description:
The last sentence should be changed to read: "The medium on a device may contain vendor specific information that is not addressable through the LBA. Such data may include defect management data and other device management information."

Suggested Solution:
Make requested correction

35 (T) Page: 12 Location: 4.6

Problem Description:
This is where the non-volatile problem needs to be handled correctly.
Change the second and third paragraph to read as follows:
"Block devices may save mode parameters and other management information on a non-removable media or in a non-volatile memory. Such devices only need to be initialized once.
Those devices without access to a non-removable media or a non-volatile memory may need initialization (possibly including formatting and/or mode parameter initialization) after each logical unit reset or power cycle prior to the processing of read or write operations.

Suggested Solution:
Make requested correction

36 (T) Page: 12 Location: 4.8

Problem Description:
"Some block devices provide the application client control through use of the mode parameters." s/b "Some block devices allow the application client some control of this additional information using mode parameters.

Suggested Solution:
Make requested correction

37 (E) Page: 13 Location: 4.9

Problem Description:
On the 5th paragraph, "store data that is written to the medium at a later time." s/b "store data that is to be written to the medium at a later time."

Suggested Solution:
Make requested correction

38 (E`) Page: 14 Location: 4.10

Problem Description:
"table" should be attached to "3" with a non-breaking space

Suggested Solution:
Make requested correction

39 (T) Page: 14 Location: 4.10

Problem Description:
SAM does not define a "current task state". The task may become the "current task" by beginning to transfer data. It may enter the "enabled task state" by being allowed to begin.
I believe what is desired here is "has become the current task for the first time" instead of "has entered the current task state for the first time". That is a measurable time, as opposed to the enabled state, which is outwardly invisible.

Suggested Solution:
Make requested correction

40 (T) Page: 15 Location: 4.10

Problem Description:
Note 4 uses the word operation, not previously defined. I believe the intent here is to warn of the danger of interrupting a sequence of commands with a reservation. The note should either be deleted or rewritten to:
"When more than one application client has access to a device server, agreement is required among application clients as to when media is reserved and released. Application clients may interrupt or interfere with each other if such conventions are not followed."

Suggested Solution:
Make requested correction

41 (E) Page: 16 Location: 4.10, Table 3

Problem Description:
The format of the key is very unclear and it should be reformatted.

Suggested Solution:
Make requested correction

42 (T) Page: 16 Location: 4.11

Problem Description:
SPC-3 makes it fairly clear that Sense Keys and Additional Sense Codes are only loosely related. The same ASC/ASCQ may be a HARDWARE ERROR, a RECOVERED ERROR, or a MEDIUM ERROR. As such, I would propose that Table 4 and the two sentences purporting to explain its purpose be deleted. The text of the first paragraph after Table 4 should probably be separated into 3 separate paragraphs describing these 3 error presentations commonly for all commands. Any others that are common to all commands should also be specified here, but most should only be specified in the explanation of the command.

Suggested Solution:
Make requested correction

43 (E) Page: 17 Location: 4.12.2

Problem Description:
First and second paragraphs need to be rewritten as:
"The typical application of a direct-access device is a magnetic disk device. The medium is a spinning disk coated with a magnetic material that allows flux changes to be induced and recorded. An actuator positions a read-write head radially across the spinning disk, allowing the device to randomly read or write the information at any radial position. Data is stored by using the write portion of the head to record flux changes and the read portion of the head to read the recorded data.

The circular path followed by the read-write head at a particular radius is called a track. The track is divided into sectors each containing blocks of stored data. If there is more than one disk spinning on a single axis and the actuator has a read-write head for each disk surface, the collection of tracks at a particular radius is called a cylinder. Some disks can access information on tracks on the same cylinder more rapidly than they can access information on adjacent tracks on the same disk surface."

Suggested Solution:
Make the requested change.

Note that a lot of this stuff is out of date the way disks are presently implemented.

44 (E) Page: 17 Location: 4.11, Table 5

Problem Description:
Question:
Is table 5 and exhaustive list? If so, is it short enough and simple enough so that it should be dropped and the information included only in the command descriptions?

Suggested Solution:
TBD

45 (E) Page: 17 Location: 4.12.2

Problem Description:
"A sector may be made up of a header, data, and a trailer" s/b "A sector may contain headers, trailers, data written in logical blocks, and radial servoing information."

Suggested Solution:
Make requested correction

46 (E) Page: 17 Location: 4.12.2

Problem Description:
"The data field begins with a synchronizing field and a data area that contains user data" s/b "The data field contains a synchronizing field and a data area that contains an encoding of user data."

Suggested Solution:

Make requested correction

47 (E) Page: 17 Location: 4.12.2

Problem Description:
Last sentence on page 17 should read: "Disk devices are non-volatile" or alternatively be deleted.

Suggested Solution:
Make either correction

48 (E) Page: 18 Location: 4.12.2

Problem Description:
"though some aspects can be evaluated" s/b "though some aspects may be visible to"

Suggested Solution:
Make requested correction

49 (T) Page: 18 Location: 4.12.2

Problem Description:
The discussion here of READ LONG and WRITE LONG, together with my knowledge of modern disk drives beg that I ask whether this usage of READ LONG and WRITE LONG should be made obsolete.

Suggested Solution:
Make READ LONG and WRITE LONG obsolete unless drive vendors indicate that their self-test program is inadequate to verify the error detection and correction mechanisms and host computer manufacturers and programmers guarantee that they will use the commands in a standard way to supplement the inadequate self-test programs.

50 (T) Page: 18 Location: 4.12.3

Problem Description:
The last sentence says "Memory block devices may store less data than disks or tapes, and may be volatile." There is no marker that describes the volatility behavior of a memory block device. I assume that means that this should be rewritten to read "Memory block devices may store less data than disks or tapes. For compliance with SBC-2, memory block devices shall be non-volatile."

Suggested Solution:
Make requested correction

51 (T) Page: 24 Location: 4.14.2.6.1

Problem Description:
The stopped state "may consume less power" than when Active, Idle, or Standby. Then again, it may consume more power. This seems pretty random to me. I would expect it would drop from "Stopped" to Active, Idle, or Standby using the Power Condition mode page timers if Active, Idle, and/or Standby were a lower power condition. I would then expect it to revert to Stopped when an action at the drive or a Start/Stop command with the proper bit set occurred. That way you won't be stuck in a "stopped" but high power state indefinitely just because someone forgot to emit the proper START/STOP command.

Alternatively, require the stopped state to consume no more power than the standby state.

Suggested Solution:
Make requested correction

52 (T) Page: 25 Location: 4.15.1

Problem Description:
Last paragraph should read:
"If the logical unit is formatted with protection information and the

EMDP bit is set to one in the Disconnect-Reconnect mode page (see SPC-3), then checking of the logical block reference tag within the service delivery subsystem without reference to the modified data pointers and logical block alignments causes false errors when logical blocks are transmitted out of order."

Suggested Solution:
Make requested correction

53 (E) Page: 29 Location: 4.15.5

Problem Description:
"fields are defined" s/b "fields is defined", since the subject is "description".

Suggested Solution:
Make requested correction

54 (T) Page: 29 Location: 4.16

Problem Description:
The grouping function should either be deleted or the following required functionality MUST be defined:
a) The support of the grouping function MUST be defined either in a mode page or in the INQUIRY command.
b) The maximum number of groups supported MUST be either fixed at 32 OR a parameter in a mode page MUST indicate the maximum number of groups supported.
c) The capture setup commands and capture information presentation commands SHOULD be defined. This may not be ready for normative text yet, but an informative annex is important here so that it doesn't develop into series of non-interoperable vendor-pair specific solutions for this function.

Suggested Solution:
Make the requested change or delete the function.

55 (E) Page: 33 Location: Table 9

Problem Description:
Item e, "supported of and only if" s/b "supported if and only if", or in plain English, "supported only if".

Suggested Solution:
Make the requested correction in Brocade 57.

56 (T) Page: 31 Location: Table 9

Problem Description:
SYNCHRONIZE CACHE does not apparently deal directly with protection information. I believe the Protection Information column should have no for both the 10 and 16 byte versions

Suggested Solution:
Make requested correction

57 (T) Page: 33 Location: Table 9

Problem Description:
Items e and f make the referenced commands mandatory if a certain bit is set to one. In fact, the commands happen to be mandatory for SMC-2, but not for SCC-2. The terminology should be for note e:
If the SCCS bit is set to one in the standard INQUIRY data, these commands shall be supported as required by SCC-2. If the SCCS bit is set to zero, these commands shall not be supported.
and for note f should be:
If the MCHGR bit is set to one in the standard INQUIRY DATA, these commands shall be supported as specified by SMC-2. If the MCHGR bit is set to zero, thse commands shall not be supported.

Suggested Solution:

Make requested correction

58 (T) Page: 31 Location: Table 9

Problem Description:
REPORT LUNS should be mandatory for direct access devices.

Suggested Solution:
Make requested correction

59 (T) Page: 34 Location: Table 10/11/12

Problem Description:
The values for reserved operation code/service action codes are "reserved for direct-access devices". In fact, they are reserved in their respective documents for the future use of any type of device. Change the text to read simply "Reserved"

Suggested Solution:
Make requested correction

60 (T) Page: 34 Location: 5.3

Problem Description:
The SERVICE ACTION IN (16) operation code is supposedly defined in SPC-3 according to the reference. In fact, there is no normative definition of the 9E that I can find either there or in any of the other expected fundemental standards. Where is it defined?

Suggested Solution:
Reference the correct document for the definition of SERVICE ACTION IN (16). If there is not such document, now is the chance to fix SPC-3 so that it is defined.

61 (T) Page: 43 Location: 5.4.2.4.4

Problem Description:
Propose to obsolete Bytes from index format address descriptor. Modern disks do not use it.

Suggested Solution:
Make requested correction

62 (T) Page: 44 Location: 5.4.2.4.5

Problem Description:
Propose to obsolete Physical sectgor format address descriptor. Modern disks do not use it.

Suggested Solution:
Make the requested correction. As a side effect, the "Translate Address" diagnostic pages shall also be made obsolete.

63 (T) Page: 30 Location: Table 9

Problem Description:
Propose to create a new type of "Type" called "D" for READ (6) and WRITE (6). The D type should be called "depricated". The depricated type should be mandatory for a target to implement in compliance with SBC-2, but should be obsolete for an application client to implement in compliance with SBC-2. That will allow READ (6) and WRITE (6) to be made obsolete in the next generation of the standard.

Suggested Solution:
Make requested correction

64 (E) Page: 50 Location: Table 33

Problem Description:
The table needs to be restructured so that it is properly terminated on a page by page basis. That probably requires dividing it into one or

two "values" per page.

The title of the "value" column s/b "RDPROTECT Value".

The term "Shall not" for the Extended INQUIRY Data VPD page column is unclear. I assume the proper wording is something like "GRD_CHK = X", "APP_CHK = X", or "REF_CHK = X", depending on the row.

Suggested Solution:
Make requested correction

65 (T) Page: 52 Location: note b

Problem Description:
Unsupported functions were previously reserved bits, and therefore should be ignored by the target receiving such a command. The READ should proceed normally. The text should be changed to read: "If the logical unit does not support protection informaton, the RDPROTECT field is ignored and the command executes normally."

Suggested Solution:
Make requested correction

66 (T) Page: 52 Location: note i

Problem Description:
The restrictions on the execution of the commands when RTO_EN is set to one are overly restrictive. The text: "If the RTO_EN bit is set to one, the .. CODE." s/b replaced with: "If the RTO_EN bit is set to one, the device server shall assume for checking purposes that the LOGICAL BLOCK REFERENCE TAG for each block has been set to the value that it would have been set to if the RTO_EN bit were zero and perform the desired checking, if any."

Suggested Solution:
Make the requested correction. Similar corrections are required for the write commands.

67 (T) Page: 55 Location: 5.13

Problem Description:
The restrictions on the execution of the READ (32) command are overly restrictive. The text: "If the RTO_EN ... the command." s/b replaced with: "If the RTO_EN bit is set to zero in the long read capacity data (see 5.15), the device server shall perform checking of the data protection fields as required by the RDPROTECT field. The device server shall terminate the command with CHECK CONDITION status with a sense key of ABORTED COMMAND and indications of the appropriate protection check if the protection information read by the device server conflicts with the information specified by the parameters in the READ (32) command."

Suggested Solution:
Make the requested correction. Similar corrections are required for the write commands.

Additional late comments may be developed by Brocade and will be numbered higher for convenience.

Late Brocade Comments:

68 (E) Page: 56 Location: 5.14, Table 39

Problem Description:
The concept of "short" and "long" is not reflected in the name of the command. Wherever "short read capacity data" is used, the term "READ CAPACITY (10) data" should be used. Wherever "long read capacity data" is used, the term "READ CAPACITY (16) data" should be used.

Suggested Solution:
Make requested corrections.

69 (T) Page: 12 Location: 4.7

Problem Description:
The definition of "implicit head of queue" seems to me to be overreaching. I believe that simple queueing should allow for implicit head of queue, but it concerns me that ORDERED also allows for it. I would prefer to see ORDERED not allowed for those commands if it has no meaning. Alternatively, ORDERED should over-ride the implicit head of queue.

Suggested Solution:
Select proper solution and implement it. Note that this effects SPC-3 also.

70 (T) Page: 36 Location: 5.4.1

Problem Description:
The FMTPINFO bit and RTO_REQ bit are dependent. When processing them in the READ CAPACITY command, they are processed independently. In order to allow the READ CAPACITY command to operate correctly, the RTO_REQ bit should not be ignored when the FMTPINFO bit is set to zero, but rather, if the INQUIRY command indicates the data protection is supported, and the FMTPINFO bit is set to zero, the RTO_REQ bit shall be set to zero. If it is set to one, it should cause an INVALID PARAMETERS IN COMMAND check condition.

Suggested Solution:
Make requested corrections.

71 (T) Page: 60 Location: 5.16

Problem Description:
Brocade 61 and 62 suggest making obsolete two of the formats. It is claimed that those formats are the ones people need for defect management in clause 5.16. I propose making obsolete the READ DEFECT DATA commands.

Suggested Solution:
Make requested corrections.

72 (T) Page: 61 Location: 5.18

Problem Description:
The text: "The most recent data written, or to be written, in the addressed field shall be returned." implies that cached data may be returned, which makes the command useless. The text should be changed to read: "The most recent data written on the recording media at the addressed field shall be returned. If the data for the specified logical block has not yet been stored on the recording media, it shall be flushed from the cache and stored on the media before the information is returned from the media."

Suggested Solution:
Make requested corrections.

73 (E) Page: 63 Location: 5.20

Problem Description:
The term "default value of FFF..." really is not correct. This is a marker value that indicates an initialized value that has not been written. I would proposed that the term "initialized value of FFF..." be used instead for all cases describing the protection information.

Suggested Solution:
Make the requested corrections in all applicable locations.

74 (E) Page: 69 Location: Tables 58-60

Problem Description:
The problems previously mentioned, including formatting and the use of "shall not" must also be corrected here.

Suggested Solution:
Make requested corrections.

75 (E) Page: 71 Location: Note a

Problem Description:
Note a, while stated correctly, gives the impression that the indicated failure will always occur, though it only occurs on cases other than case 0. I propose the sentence be pre-fixed with "For these cases, "

Suggested Solution:
Make the requested corrections in all applicable locations.

76 (T) Page: 71 Location: Note g

Problem Description:
This case is interesting and requires careful thought. The logical block application tag field of FFFFh is symptomatic of a block that has not been changed since formatting, but not much else. It may be that there was a choice to set it to FFFFh by the application client. Why should checking be disabled unless all the fields are set to FFFFh?

Suggested Solution:
Please verify that this was the intended action and indicate why? If it needs to be corrected here, there are a number of other tables to also be corrected.

77 (T) Page: 84 Location: 5.32

Problem Description:
The restriction of the RTO_EN to one while using the 32-byte command appears to be unnecessary. See Brocade 67.

Suggested Solution:
Make the corresponding changes as in Brocade 67.

78 (T) Page: 85 Location: 5.33

Problem Description:
The restrictions requiring the RTO_EN bit to be 0 for the following commands are overly restrictive, as described in Brocade 66. Note that for the XDWRITE commands, performing the XDWRITE with no checking is the only way to obtain the necessary XOR function for the case where RTO_EN is equal 1.
WRITE AND VERIFY (10), WRITE AND VERIFY (12), WRITE AND VERIFY (16), WRITE SAME (10), WRITE SAME (16), XDWRITE (10), XDWRITE (32), XDWRITEREAD (10), XDWRITEREAD (32)

Note that for the XDWRITE and XDWRITEREAD commands, performing the XDWRITE with no checking is the only way to obtain the necessary XOR function for the case where RTO_EN is equal 1

Suggested Solution:
Make the corresponding changes as in Brocade 66.

79 (T) Page: 87 Location: 5.36

Problem Description:
The restriction of the RTO_EN to one while using the 32-byte command appears to be unnecessary. See Brocade 67.

Suggested Solution:
Make the corresponding changes as in Brocade 67.

80 (T) Page: 92 Location: 5.41

Problem Description:
The restriction of the RTO_EN to one while using the 32-byte command appears to be unnecessary. See Brocade 67.

Suggested Solution:
Make the corresponding changes as in Brocade 67.

81 (T) Page: 93 Location: 5.42

Problem Description:
The statement: "If the XORPINFO bit is set to one and the device server does not support protection information..." violates the conventions for reserved fields. The device server is not required to check for this condition, since XORPINFO was previously a reserved bit. The command should, under these conditions, be performed exactly as if the XORPINFO was zero.

Note that this does not apply to XDWRITEREAD commands, since they were not defined in a previous standard.

Suggested Solution:
Make requested corrections.

82 (T) Page: 94 Location: 5.43

Problem Description:
See Brocade 81. The same is true for XDREAD (32) if it was contained in SBC.

Suggested Solution:
Make requested corrections.

83 (T) Page: 99 Location: 5.4.8

Problem Description:
See Brocade 81. The same is true for XPWRITE (32) if it was contained in SBC.

Suggested Solution:
Make requested corrections.

84 (T) Page: 101 Location: 6.1.1

Problem Description:
Are we ready to get rid of the "translate address output/input diagnostic pages? If so, they should be made obsolete at this time.

Suggested Solution:
Make requested corrections.

85 (E) Page: 105 Location: 6.2.2

Problem Description:
I assume this uses the format from table 186 from SPC-3, but this is not explicitly made clear. Could you please provide a reference indicating something like "See the log page structure and page codes for all device types specified in SPC-3." The structure does not specify a field size for each counter, which implies that it is vendor specific.

Suggested Solution:
Make requested corrections.

86 (T) Page: 107 Location: Table 101

Problem Description:
The WP bit is specified here, but it is indicated that it cannot be set with a MODE SELECT command. How then is it set through the SCSI interface? I did not find an SPC-2 mechanism for setting it and I don't believe a hardware-only mechanism is appropriate. That leaves only here to set it. I propose that the first sentence after Table 101 be corrected to indicate that WP is defined and controlled for disk drives by this parameter.

Suggested Solution:
Make requested corrections.

****

Comments attached to Yes ballot from Robert H. Nixon of
Emulex:

Emulex #1
PDF Page 1
Page 1 Figure 1: In the leftmost box, 1477 s/b/ 14776

Emulex #2
PDF Page 1
page 1 clause 1: "provide the following" breaks grammatical flow to the
items of the following list. Delete it.

Emulex #3
PDF Page 1
Unmarked set by bnixon

Emulex #4
PDF Page 1
Page 1 Clause 1: "It indicates the applicability of a standard to the
implementation of a given transport" does not seem to be relevant to a
command set standard. I'm not convinced that it is even true. Delete it.

Emulex #5
PDF Page 3
Page 3 subclause 2.2: For reliable location of documents at the ANSI and
INCITS stores, change "ANSI NCITS.318:1998" to "ANSI INCITS 318-1998"

Emulex #6
PDF Page 5
Page 5 subclause 3.1.17: The definition of extent uses the ambiguous
concept of "continuous logical blocks". Change "continuous logical
blocks" to "logical blocks occupying contiguous logical block addresses"

Emulex #7
PDF Page 6
Page 6 subclause 3.1.39:
SACL is referenced but is not in the abbreviations list. (Yes, I know it
is within the next entry in the glossary, but only because I was reading
serially through the spec 8-)

Emulex #8
PDF Page 8
Page 8 subclause 3.3.10:The equivalence to reserved in the definition of
restricted would force conflict, as this standard would require setting
to zero a value that another standard might require to be nonzero.
Change "A restricted bit, byte, word, or field shall be treated as a
reserved bit, byte, word or field for the purposes of the requirements
defined in this standard" to "A restricted bit, byte, word or field
shall be set to zero, or in accordance with another SCSI standard.
Recipients are not required by this standard to check restricted bits,
bytes, words or fields for zero values"

Emulex #9
PDF Page 10
Page 10 subclause 4.1: in the second paragraph, "In addition," doesn't
add anything. Change "In addition, a logical block length..." to "A
logical block length..."

Emulex #10
PDF Page 11
Page 11 subclause 4.4: in the third line of the fourth regular
paragraph, an s/b and

Emulex #11
PDF Page 14
Page 14 subclause 4.9: The last sentence of the paragraph fragment at
the top of page 14 has too many consecutive verbs and not enough

meaning. Change "The FUA_NV bit specifies allows the device server" to "The FUA_NV bit specifies whether the device server is allowed"

Emulex #12
PDF Page 15
Page 15 table 3: Why are the READ DEFECT DATA and READ LONG commands conflicted by Write type reservations?

Emulex #13
PDF Page 17
Page 17 subclause 4.12.2: In the second paragraph from the bottom of the page, "user" should be "application client". Users, in the common sense of the term, are people, and can't issue SCSI commands.

Emulex #14
PDF Page 20
Page 20 subclause 4.13.1.2.3: In the fifth line, e.g s/b i.e

Emulex #15
PDF Page 20
Page 20 subclause 4.13.1.2.3: The last three sentences appear to be repeating the rest of the subclause. Delete the last three sentences.

Emulex #16
PDF Page 26
Page 26 subclause 4.16.2: In the last paragraph, the wording strongly suggests the LOGICAL BLOCK REFERENCE TAG appears in the application client data buffer. In the second sentence change "contain" to "have a LOGICAL BLOCK REFERENCE TAG value equal to", in the third sentence change "contain" to "have", and in the fourth sentence change "contains" to "has". For consistency. (part of prior comment) Change "contain" to "have"

Emulex #18
PDF Page 26
(part of prior comment)
change "contains" to "has"

Emulex #19
PDF Page 60
Page 60 subclause 5.16: I can't make sense of the first sentence of the second paragraph on page 60: how can the number of address descriptors the SCSI device has assigned contain a value that is insufficient to transfer all of the address descriptors? Isn't the "number ... assigned" the same as "all"? Also, the third sentence seems to contradict note 16.

****

Comments attached to No ballot from Ralph O. Weber of ENDL:

ENDL 1
PDF pg 5, pg v
SPI-4 was dedicated to Gene Milligan. But it appears that the practice ended with SPI-5. Is it appropriate to reinstate the practice now? Probably not.

ENDL 2
PDF pg 5, pg v
<<Memorial gifts may be made to Habitat for Humanity.>> It seems unlikely the Habitat for Humanity has maintained a memorial account for Gene Milligan for all the years that have passed since his passing in 2001. If the dedication is kept, this sentence should be removed.

ENDL 3
PDF pg 6, pg vi
Remove Revision Information before submitting dpANS to Public Review.

ENDL 4
PDF pg 11, pg xi

Remove change bars before submitting dpANS to Public Review.

ENDL 5
PDF pg 11, pg xi, Contents
Per ISO style guide, the table of contents should use only two levels of indenting, Clauses and Sub-Clauses.

ENDL 6
PDF pg 21, pg xxi, Introduction
<<Clause 4 (Models)>> [s/b] <<Clause 4 (Direct-access block device type model)>> Unlike SBC, there is only one device-type model in SBC-2.

ENDL 7
PDF pg 22, pg 1, 1 Scope
<<The clauses of this standard pertaining to the SCSI block device class, implemented in conjunction with the applicable clauses of SPC-3, fully specify the standard command set for SCSI block devices.>> I cannot find any clauses in this standard that apply to devices other than SCSI block device. This needs rewording.

ENDL 8
PDF pg 22, pg 1, 1 Scope
<<SCSI block device>> [s/b] <<direct-access>

ENDL 9
PDF pg 22, pg 1, 1 Scope
<<Define commands to manage the operation of SCSI block devices;>> What is the difference between this list entry and the previous one <<Define commands unique to the type of SCSI block device;>>? The second, redundant entry should be deleted.

ENDL 10
PDF pg 22, pg 1, 1 Scope
<<Define the differences between types of SCSI block devices>> Since there is only one type of SCSI block device defined by this standard, this list entry should be deleted.

ENDL 11
PDF pg 24, pg 3, 2.1 Normative references overview
<<ITUT>> [s/b] <<ITU-T>>

ENDL 12
PDF pg 26, pg 5, 3.1 Definitions
Add <<See SAM-3.>> as the last sentence in the definitions of data-in buffer, data-out buffer, and domain.

ENDL 13
PDF pg 26, pg 5, 3.1 Definitions
Add a glossary entry for error correcting code (ECC)

ENDL 14 Technical
PDF pg 26, pg 5, 3.1.16 exclusive-or (XOR)
<<In this standard the term encompasses the entire algorithm but does not define the specific polynomial.>> ??? How does a polynomial relate to an XOR function? Delete <<but does not define the specific polynomial>>

ENDL 15
PDF pg 26, pg 5, 3.1.16 exclusive-or (XOR)
Several changes are proposed to use 'extent' as defined here. If the proposed changes are not made, then the glossary entry for 'extent' should be deleted because it is not referenced anywhere in this standard (as currently written).

ENDL 16
PDF pg 27, pg 6, 3.1 Definitions
Add glossary entry for I_T nexus loss event.

ENDL 17
PDF pg 27, pg 6, 3.1 Definitions
<<3.1.26 media: Plural of medium.>> There is no glossary entry for

medium, meaning that medium is used in its normal English usage. It would seem that media is likewise used in its normal English usage. Remove this unnecessary glossary entry.

ENDL 18
PDF pg 27, pg 6, 3.1.29 power cycle
<<Power being removed followed by power on.>> [s/b] <<Power being removed and reinstated.>>

ENDL 19
PDF pg 27, pg 6, 3.1 Definitions
<<3.1.33 read-only medium: Medium that is not capable of being changed. The medium contains data prepared in a manner not defined by this standard.>> The term read-only medium is not used anywhere in this standard. This glossary entry should be removed.

ENDL 20
PDF pg 27, pg 6, 3.1.35 reset event
The definition of reset event is not consistent with SAM-3. Update the definition to be consistent with SAM-3, probably by emulating the definition of logical unit reset event.

ENDL 21
PDF pg 27, pg 6, 3.1.36 sense data
<<Data describing an error or exceptional condition that a device server delivers to an application client.>> [s/b] <<<<Data describing an error or exceptional condition that a device server delivers to an application client in association with a CHECK CONDITION status.>>

ENDL 22
PDF pg 27, pg 6, 3.1 Definitions
<<3.1.40 storage array conversion layer (SACL): Converts input logical unit numbers to output logical unit numbers and may convert input LBAs to output LBAs. See SCC-2.>> Neither storage array conversion layer nor SACL are used anywhere in this standard. This glossary entry should be deleted.

ENDL 23 Technical
PDF pg 28, pg 7, 3.1 Definitions
<<3.1.41 update: To write new data to a logical block without destroying the previous data. After a logical block has been updated, a normal read returns the most recent generation of the data. Earlier generations are still available after the update.>> This definition appears to be specific to optical memory devices which are obsolete in this standard. This definition should be deleted.

ENDL 24 Technical
PDF pg 28, pg 7, 3.1 Definitions
Add either a glossary entry or keyword definition for 'vendor specific'.

ENDL 25
PDF pg 28, pg 7, 3.2 Symbols and abbreviations
<<ECC error correcting code>> [s/b] <<ECC error correcting code (see 3.1.xx)>>

ENDL 26
PDF pg 28, pg 7, 3.2 Symbols and abbreviations
<<ID identifier>> ID is not used anywhere in this standard. Delete this acronym.

ENDL 27
PDF pg 28, pg 7, 3.2 Symbols and abbreviations
kbit is not used anywhere in this standard. Delete this acronym.

ENDL 28
PDF pg 28, pg 7, 3.2 Symbols and abbreviations
Mbit is not used anywhere in this standard. Delete this acronym.

ENDL 29
PDF pg 28, pg 7, 3.2 Symbols and abbreviations
<<SACL storage array conversion layer (see 3.1.40)>> SACL is not used

anywhere in this standard. This acronym should be deleted.

ENDL 30
PDF pg 30, pg 9, 3.4 Conventions
<<Underscores may be included in hexadecimal values to increase readability or delineate field boundaries (e.g., FD8C_FA23h).>> All instances of 'increased readability found in this standard use spaces, not underscores. If maintenance of the underscore convention is desired, deviations from it have been marked in other comments. Otherwise, it might be easier to change the convention.

ENDL 31
PDF pg 31, pg 10, 4.1 General
<<SCSI block devices>> [s/b] <<SCSI direct-access block devices>>

ENDL 32
PDF pg 31, pg 10, 4.1 General
<<rigid disks and removable rigid disks>> [s/b] <<rigid disks, removable rigid disks, and removable flexible disks>>

ENDL 33
PDF pg 31, pg 10, 4.1 General
<<almost always greater>> [s/b] <<greater>>

ENDL 34
PDF pg 31, pg 10, 4.1 General
<<In addition, a>> [s/b] <<A>>

ENDL 35
PDF pg 31, pg 10, 4.1 General
<<Each logical block has a block length associated with it.>> This sentence repeats what was said in the previous paragraph. It should be deleted.

ENDL 36 Technical
PDF pg 31, pg 10, 4.1 General
<<This means that the block length for the medium can change from logical block to logical block. However, for simplicity the block length typically remains constant over the entire capacity of the medium.>> Is it really true that different logical blocks can have different block lengths (as opposed to different physical block lengths)? If so, is this under the control of the application client via a FORMAT UNIT command? 6.3.1 says that there is only one mode descriptor for the entire logical unit, so it seems unlikely that the cited statements are true. Probably, these two sentences should be deleted. If not, they should be changed to <<The block length for the medium may change from one logical block to next. For simplicity descriptions in this standard assume that the block length typically remains constant over the entire capacity of the medium.>>

ENDL 37
PDF pg 31, pg 10, 4.1 General
Start a new paragraph for <<The block length does not include the length of protection information and additional information, if any, that are associated with the logical block.>>

ENDL 38
PDF pg 31, pg 10, 4.2 Direct-access device type model overview
<<Other commands issued by the application client may also cause write and read operations to occur.>> This sentence is unnecessary because the use of e.g. in the previous sentence clearly indicates that the cited commands are just examples. This sentence should be deleted.

ENDL 39
PDF pg 31, pg 10, 4.2 Direct-access device type model overview
<<on the medium>> [s/b] <<to the medium>> for consistence with the description of read operations.

ENDL 40
PDF pg 31, pg 10, 4.2 Direct-access device type model overview
<<can be read>> [s/b] <<are capable of being read>>

ENDL 41
PDF pg 31, pg 10, 4.2 Direct-access device type model overview
<<controller>> [s/b] <<device server>>

ENDL 42
PDF pg 31, pg 10, 4.3.1 Removable medium overview
<<If the block device implements cache memory, either volatile or non-volatile, it ensures that all logical blocks of the medium contain the most recent user data and protection information, if any, prior to permitting unmounting of the removable medium.>> This sentence should be moved to a paragraph by itself, preferably immediately preceding this paragraph in which it currently appears.

ENDL 43
PDF pg 32, pg 11, 4.3.2 Removable medium with an attached medium changer
<<may be done>> [s/b] <<may be accomplished>>

ENDL 44
PDF pg 32, pg 11, 4.3.2 Removable medium with an attached medium changer
<<the logical unit>> [s/b] <<the block device logical unit>>

ENDL 45
PDF pg 32, pg 11, 4.3.2 Removable medium with an attached medium changer
<<permitted (element 0)>> [s/b] <<permitted (i.e., element 0)>>

ENDL 46
PDF pg 32, pg 11, 4.4 Logical blocks
<<medium controller>> [s/b] <<device server>>

ENDL 47
PDF pg 32, pg 11, 4.4 Logical blocks
<<data and the>> [s/b] <<data, the>>

ENDL 48
PDF pg 32, pg 11, 4.4 Logical blocks
<<be issued>> [s/b] <<be used>>

ENDL 49 Technical
PDF pg 32, pg 11, 4.4 Logical blocks
<<Each logical block has a block length associated with it.>> [s/b] <<All logical blocks have the same logical block length associated with them.>>

ENDL 50
PDF pg 32, pg 11, 4.4 Logical blocks
<<block lengths that are>> [s/b] <<block length that is>>

ENDL 51
PDF pg 32, pg 11, 4.4 Logical blocks
<<variable block lengths>> [s/b] <<changeable block lengths>>

ENDL 52
PDF pg 32, pg 11, 4.5 Ready state
<<can be processed>> [s/b] <<are able to transfer data to or from the medium>>

ENDL 53
PDF pg 32, pg 11, 4.5 Ready state
<<mounted. Such a block device, with a volume not mounted,>> [s/b] <<mounted and other conditions are met (see 4.12). A block device that is not ready>>

ENDL 54
PDF pg 33, pg 12, 4.5 Ready state
<<device ready>> [s/b] <<device to the ready state>>

ENDL 55 Technical
PDF pg 33, pg 12, 4.6 Initialization
<<logical unit reset>> [s/b] <<logical unit reset event>>

ENDL 56
PDF pg 33, pg 12, 4.6 Initialization
<<reissued>> [s/b] <<issued>>

ENDL 57
PDF pg 33, pg 12, 4.6 Initialization
<<with MODE SELECT>> [s/b] <<with a MODE SELECT command>>

ENDL 58
PDF pg 33, pg 12, 4.7 Implicit HEAD OF QUEUE command processing
<<this command set>> [s/b] <<this standard>>

ENDL 59
PDF pg 33, pg 12, 4.8 Medium defects
<<can>> [s/b] <<may>>

ENDL 60 Technical
PDF pg 33, pg 12, 4.8 Medium defects
<<Some block devices provide the application client control through use of the mode parameters.>> Control of what? Mode parameters in what mode pages? Add specific details and cross references.

ENDL 61
PDF pg 33, pg 12, 4.8 Medium defects
<<they do not appear in a logical block>> [s/b] <<they do not affect any logical blocks>>

ENDL 62
PDF pg 33, pg 12, 4.8 Medium defects
<<The algorithm may be controlled by the application client, using options in the FORMAT UNIT command.>> This sentence is redundant with the paragraph that precedes it and should be deleted.

ENDL 63
PDF pg 33, pg 12, 4.8 Medium defects
<<which>> [s/b] <<that>>

ENDL 64
PDF pg 33, pg 12, 4.8 Medium defects
<<device server (to reference while formatting)>> [s/b] <<device server for reference during formatting>>

ENDL 65
PDF pg 33, pg 12, 4.8 Medium defects
<<be subject to change >> [s/b] <<be changed>>

ENDL 66
PDF pg 34, pg 13, 4.8 Medium defects
<<If the DEFECT LIST LENGTH field in the parameter list header is set to zero, there is no DLIST>> this statement belongs in 5.4.2.2, not in the model.

ENDL 67
PDF pg 34, pg 13, 4.8 Medium defects
<<theprevious>> [s/b] <<the previous>>

ENDL 68
PDF pg 34, pg 13, 4.8 Medium defects
<<can>> [s/b] <<may>>

ENDL 69
PDF pg 34, pg 13, 4.8 Medium defects
<<Some block devices>> [s/b] <<Block devices>>

ENDL 70
PDF pg 34, pg 13, 4.9 Cache memory
<<Some block devices implement>> [s/b] <<Block devices may implement>>

ENDL 71
PDF pg 34, pg 13, 4.9 Cache memory
Delete <<usually>>

ENDL 72
PDF pg 34, pg 13, 4.9 Cache memory
<<can>> [s/b] <<may>>

ENDL 73
PDF pg 34, pg 13, 4.9 Cache memory
The 3rd and 4th paragraphs in this subclause should be the 2nd and 3rd paragraphs.

ENDL 74
PDF pg 34, pg 13, 4.9 Cache memory
<<at a later time. This is called write-back caching.>> [s/b] <<at a later time (i.e., write-back caching).>>

ENDL 75
PDF pg 34, pg 13, 4.9 Cache memory
<<In order to detect these errors, the VERIFY and WRITE AND VERIFY commands are provided.>> [s/b] <<The VERIFY and WRITE AND VERIFY commands may be used to detect these errors.>>

ENDL 76
PDF pg 34, pg 13, 4.9 Cache memory
<<this bit>> [s/b] <<the DPO bit>> [twice in this paragraph]

ENDL 77
PDF pg 34, pg 13, 4.9 Cache memory
<<Sometimes the application client may want to have the>> [s/b] <<Application clients may request that>>

ENDL 78
PDF pg 35, pg 14, 4.9 Cache memory
<<The FUA_NV bit specifies allows the device server to access a non-volatile cache rather than the medium.>> This topic belongs in a separate paragraph and the description should be as complete as that given for the FUA bit.

ENDL 79
PDF pg 35, pg 14, 4.9 Cache memory
What happens when the DPO and FUA_NV bits are both set to one? What happens when the DPO, FUA, AND FUA_NV bits are all set to one? The model is not complete.

ENDL 80
PDF pg 35, pg 14, 4.9 Cache memory
<<WRITE AND VERIFY>> [s/b] <<WRITE AND VERIFY command>>

ENDL 81 Technical
PDF pg 35, pg 14, 4.9 Cache memory
<<Furthermore, a synchronize cache operation is also implied to write unwritten logical blocks still in the cache memory.>> This sentence seems unrelated to the topic being discussed in this paragraph. Since the SYNCHRONIZE CACHE command is covered later in this subclause, this sentence should be deleted.

ENDL 82
PDF pg 35, pg 14, 4.9 Cache memory
<<LOCK UNLOCK CACHE command (see 5.5) controls>> [s/b] <<LOCK UNLOCK CACHE(10) command (see 5.5) and LOCK UNLOCK CACHE(16) command (see 5.6) control>>

ENDL 83
PDF pg 35, pg 14, 4.9 Cache memory
<<the data cache>> [s/b] <<cache memory>> to use the defined term [twice in the a,b,c list]

ENDL 84
PDF pg 35, pg 14, 4.9 Cache memory
<<PRE-FETCH command (see 5.7) causes>> [s/b] <<PRE-FETCH(10) command (see 5.7) and PRE-FETCH(16) command (see 5.8) cause>>

ENDL 85
PDF pg 35, pg 14, 4.9 Cache memory
<<SYNCHRONIZE CACHE command (see 5.22) forces>> [s/b] <<SYNCHRONIZE CACHE(10) command (see 5.22) SYNCHRONIZE CACHE(16) command (see 5.23) forces force>>

ENDL 86
PDF pg 35, pg 14, 4.9 Cache memory
<<pending write data>> [s/b] <<write data in cache memory>>

ENDL 87
PDF pg 35, pg 14, 4.9 Cache memory
<<stored in>> [s/b] <<written to>>

ENDL 88
PDF pg 35, pg 14, 4.9 Cache memory
<<This command>> [s/b] <<These commands>>

ENDL 89
PDF pg 35, pg 14, 4.9 Cache memory
<<was written>> [s/b] <<is written>>

ENDL 90
PDF pg 35, pg 14, 4.9 Cache memory
<<(see 6.3.3) writeable by the MODE SELECT command>> [s/b] <<(see 6.3.3), writeable by the MODE SELECT command,>> [i.e., add two commas]

ENDL 91
PDF pg 35, pg 14, 4.9 Cache memory
<<basic elements of cache replacement algorithms>> [s/b] <<basic features of the cache replacement algorithms>>

ENDL 92
PDF pg 35, pg 14, 4.10 Reservations
<<initiators>> [s/b] <<I_T nexuses>> [2 times in this paragraph]

ENDL 93
PDF pg 35, pg 14, 4.10 Reservations
<<Extent reservations and RESERVE/RELEASE reservations have been made obsolete in SPC-3 and in this standard.>> This statement belongs in clause 1, not here.

ENDL 94
PDF pg 36, pg 15, 4.10 Reservations
<<NOTE 4 - When a system is integrated with more than one application client, agreement is required between the application clients as to how media is reserved and released during operations, otherwise, an application client may be locked out of access to a logical unit in the middle of an operation.>> The third paragraph from the bottom of the previous page explicitly says that this note is false. Delete the note.

ENDL 95
PDF pg 36, pg 15, 4.10 Reservations
It the table 3 heading, <<initiator>> [s/b] <<I_T nexus>> [4 times

ENDL 96
PDF pg 36, pg 15, 4.10 Reservations
Since only persistent reservations are covered by this standard, the use of <<[B]>> should be removed from the table 3 heading and the key.

ENDL 97
PDF pg 36, pg 15, 4.10 Reservations
The ERASE (10)/(12) commands are not defined by this standard. Remove the ERASE (10)/(12) commands from table 3.

ENDL 98
PDF pg 36, pg 15, 4.10 Reservations
The MEDIUM SCAN command is not defined by this standard. Remove the MEDIUM SCAN command from table 3.

ENDL 99

PDF pg 36, pg 15, 4.10 Reservations
The READ GENERATION command is not defined by this standard. Remove the READ GENERATION command from table 3.

ENDL 100
PDF pg 36, pg 15, 4.10 Reservations
The READ UPDATED BLOCK command is not defined by this standard. Remove the READ UPDATED BLOCK command from table 3.

ENDL 101
PDF pg 36, pg 15, 4.10 Reservations
The UPDATE BLOCK command is not defined by this standard. Remove the UPDATE BLOCK command from table 3.

ENDL 102
PDF pg 36, pg 15, 4.10 Reservations
There should be a double line at the bottom of the first page of table 3.

ENDL 103
PDF pg 37, pg 16, 4.10 Reservations
<<initiators>> [s/b] <<I_T nexuses>> [4 times in the table 3 footnotes]

ENDL 104
PDF pg 37, pg 16, 4.10 Reservations
Per the ISO style guide, the table 3 key must appear every page on which the table appears (i.e., it needs to be a table footer row)

ENDL 105
PDF pg 37, pg 16, 4.11 Error reporting
<<conditions in>> [s/b] <<conditions listed in>>

ENDL 106
PDF pg 37, pg 16, 4.11 Error reporting
<<appropriate>> [s/b] <<specified>>

ENDL 107
PDF pg 37, pg 16, 4.11 Error reporting
<<When an invalid LBA is encountered,>> [s/b] <<When a command attempts to access an invalid LBA,>>

ENDL 108
PDF pg 38, pg 17, 4.11 Error reporting
<<but the sense data contains an INFORMATION field value or COMMAND-SPECIFIC INFORMATION field value too large for the fixed format sense data>> [s/b] <<but the values to be placed in the sense data include a value that is too large to fit in the fixed format INFORMATION field or COMMAND-SPECIFIC INFORMATION field >>

ENDL 109
PDF pg 38, pg 17
<<4.12 Examples>> [s/b] <<4.12 Direct-access device examples>>

ENDL 110
PDF pg 38, pg 17
<<4.12.1 Examples overview>> [s/b] <<4.12.1 Overview>>

ENDL 111
PDF pg 38, pg 17, 4.12.2 Rotating media
<<is done>> [s/b] <<is accomplished>>

ENDL 112
PDF pg 38, pg 17, 4.12.2 Rotating media
<<head, and a rotating disk.>> [s/b] <<head with respect to a rotating disk>>

ENDL 113
PDF pg 38, pg 17, 4.12.2 Rotating media
<<can be>> [s/b] <<is capable of being>>

ENDL 114

PDF pg 38, pg 17, 4.12.2 Rotating media
<<load or start commands>> [s/b] <<a START STOP UNIT command>>

ENDL 115
PDF pg 38, pg 17, 4.12.2 Rotating media
<<A disk device may have to be formatted prior to the initial access. Exceptions to this are devices that are formatted at the factory. A disk device format may create headers for each sector and initialize the data field. The MODE SELECT command is often used prior to formatting to establish the geometry (e.g., logical block length) and defect management scheme.>> This information is covered better in 4.6. Delete everything in this paragraph except the last sentence.

ENDL 116
PDF pg 39, pg 18, 4.12.2 Rotating media
<<can>> [s/b] <<may>>

ENDL 117
PDF pg 39, pg 18, 4.12.2 Rotating media
<<The device server may reserve some sectors and tracks for recording defect lists and for reassigning defective blocks.>> Is the discussion of sectors and tracks appropriate in SBC-2? This sentence can be deleted because its concepts are covered in 4.8.

ENDL 118
PDF pg 39, pg 18, 4.12.2 Rotating media
<<user data and checksum>> [s/b] <<user data and ECC>>

ENDL 119
PDF pg 39, pg 18, 4.12.2 Rotating media
<<the device server>> [s/b] <<the disk device>>

ENDL 120
PDF pg 39, pg 18, 4.12.2 Rotating media
<<'mirror copies.'>> [s/b] <<block-for-block copies of disk devices.>>

ENDL 121 Technical
PDF pg 39, pg 18, 4.12.2 Rotating media
Should the relationship between rotating media and cache memory be discussed?

ENDL 122
PDF pg 39, pg 18, 4.12.3 Memory media
<<Memory media includes logical units that are traditionally used for primary storage within computer systems, such as solid state static or dynamic random access memories (e.g., SRAM, DRAM, or Flash).>> [s/b] <<Memory media is based on solid state static or dynamic random access memories (e.g., SRAM, DRAM, or Flash). Memory media logical units may be used for fast-access storage within complex computer systems.>>

ENDL 123 Technical
PDF pg 39, pg 18, 4.12.3 Memory media
When is memory media ready? This is explained for rotating media, why not for memory media?

ENDL 124 Technical
PDF pg 39, pg 18, 4.12.3 Memory media
Is memory media removable? This is discussed for rotating media, why not for memory media?

ENDL 125 Technical
PDF pg 39, pg 18, 4.12.3 Memory media
How does memory media manage defects? This is summarized for rotating media, why not for memory media?

ENDL 126 Technical
PDF pg 39, pg 18, 4.12.3 Memory media
Does memory media use cache memory?

ENDL 127
PDF pg 39, pg 18, 4.13.1 Model for XOR commands overview

<<storage array controller>> [s/b] <<storage array controller (see 3.1.39)>>

ENDL 128
PDF pg 39, pg 18, 4.13.1 Model for XOR commands overview, Global in this subclause
<<storage devices>> [s/b] <<block devices>> & <<storage device>> [s/b] <<block device>> [3 instances]

ENDL 129
PDF pg 39, pg 18, 4.13.1 Model for XOR commands overview
<<used by this model>> [s/b] <<of interest to the model in this standard>>

ENDL 130
PDF pg 39, pg 18, 4.13.1 Model for XOR commands overview
<<exclusive-or (XOR)>> [s/b] <<XOR (see3.1.16) >>

ENDL 131
PDF pg 39, pg 18, 4.13.1 Model for XOR commands overview
<<array known as protected data>> [s/b] <<array (i.e., the protected data)>>

ENDL 132
PDF pg 39, pg 18, 4.13.1 Model for XOR commands overview
<<interconnect>> [s/b] <<service delivery subsystem>> Post letter ballot SAM-3 will no longer define interconnect.

ENDL 133
PDF pg 39, pg 18, 4.13.1 Model for XOR commands overview
<<For example, when>> Should begin as a new paragraph and [s/b] <<When>>

ENDL 134
PDF pg 39, pg 18, 4.13.1 Model for XOR commands overview
<<A command sequence for each of these operations is defined for the following operating modes. The command sequences use the device server to perform the XOR functions needed for the major operations.>> [s/b] <<Command sequences defined for each of these operations use the device server to perform the XOR functions.>> Alternatively, specific details may be added describing 'the following operating modes'.

ENDL 135
PDF pg 39, pg 18
There is a 4.13.1 but no 4.13.2.

Change from:
4.13 Model for XOR commands
4.13.1 Model for XOR commands overview
4.13.1.1 Storage array controller supervised XOR operations
4.13.1.1.1 Storage array controller supervised XOR operations overview
4.13.1.1.2 Update write operation (storage array controller supervised)
4.13.1.1.3 Regenerate operation (storage array controller supervised)
4.13.1.1.4 Rebuild operation (storage array controller supervised)
4.13.1.2 Additional array subsystem considerations
4.13.1.2.1 Additional array subsystem considerations overview
4.13.1.2.2 Buffer full status handling
4.13.1.2.3 Access to an inconsistent stripe
4.13.1.3 Error handling considerations
4.13.1.3.1 Error handling considerations overview
4.13.1.3.2 Primary errors - errors resulting directly from the primary command
4.13.1.4 XOR data retention requirements

to:
4.13 Model for XOR commands
4.13.1 Model for XOR commands overview
4.13.2 Storage array controller supervised XOR operations
4.13.2.1 Storage array controller supervised XOR operations overview
4.13.2.2 Update write operation
4.13.2.3 Regenerate operation
4.13.2.4 Rebuild operation

4.13.3 Additional array subsystem considerations
4.13.3.1 Additional array subsystem considerations overview
4.13.3.2 Buffer full status handling
4.13.3.3 Access to an inconsistent stripe
4.13.4 Error handling considerations
4.13.4.1 Error handling considerations overview
4.13.4.2 Primary errors - errors resulting directly from the primary command
4.13.5 XOR data retention requirements

ENDL 136
PDF pg 39, pg 18, 4.13.1.1.1 Storage array controller supervised XOR operations overview
<<READ and WRITE commands>> [s/b] <<READ commands and WRITE commands>>

ENDL 137
PDF pg 39, pg 18, 4.13.1.1.1 Storage array controller supervised XOR operations overview
<<for certain operations>> explains nothing and should be deleted.

ENDL 138
PDF pg 39, pg 18, 4.13.1.1.1 Storage array controller supervised XOR operations overview
<<domain>> [s/b] <<domain (see 3.1.15)>>

ENDL 139
PDF pg 39, pg 18, 4.13.1.1.1 Storage array controller supervised XOR operations overview
<<by the>> [s/b] <<to the>>

ENDL 140
PDF pg 40, pg 19, 4.13.1.1.2 Update write operation
<<(storage array controller supervised)>> adds no value to this (and two other subclause headings and be deleted [3 times].

ENDL 141
PDF pg 40, pg 19, 4.13.1.1.2 Update write operation
<<user data>> [s/b] <<user data and protection information (see 3.1.32)>>

ENDL 142
PDF pg 40, pg 19, 4.13.1.1.2 Update write operation
<<parity information>> [s/b] <<XOR data>>

ENDL 143
PDF pg 40, pg 19, 4.13.1.1.3 Regenerate operation
<<a logical block,>> [s/b] <<one or more logical blocks>>

ENDL 144
PDF pg 40, pg 19, 4.13.1.1.3 Regenerate operation
<<protection information>> [s/b] <<protection information (see 3.1.32)>>

ENDL 145
PDF pg 40, pg 19, 4.13.1.1.3 Regenerate operation
<<is done>> [s/b] <<is accomplished>>

ENDL 146
PDF pg 40, pg 19, 4.13.1.1.3 Regenerate operation
<<bit set>> [s/b] <<bit set to one>>

ENDL 147
PDF pg 40, pg 19, 4.13.1.1.3 Regenerate operation
<<step 2>> [s/b] <<step 2)>> for consistency with the sentence that follows the 1,2,3 list.

ENDL 148
PDF pg 40, pg 19, 4.13.1.1.3 Regenerate operation
<<devices (except the failed device) in the redundancy group>> [s/b] <<devices in the redundancy group except the failed device>>

ENDL 149

PDF pg 40, pg 19, 4.13.1.1.3 Regenerate operation
Start a new paragraph not in the 1,2,3 list for <<The intermediate XOR data returned by the last XDREAD command is the regenerated user data for the failed device.>> This information is not part of step 4. It is not part of the step-wise algorithm.

ENDL 150
PDF pg 40, pg 19, 4.13.1.1.3 Regenerate operation
<<XDWRITEREAD command may be sent to the device.>> [s/b] <<XDWRITEREAD command with the DISABLE WRITE bit set to one may be used.>>

ENDL 151
PDF pg 40, pg 19, 4.13.1.1.4 Rebuild operation
<<The sequence is as follows:>> [s/b] <<The number of steps is dependent on the number of devices in the redundancy group, but the sequence is as follows:>>

ENDL 152
PDF pg 40, pg 19, 4.13.1.1.4 Rebuild operation
<<step 2>> [s/b] <<step 2)>> for consistency with the sentence that follows the 1,2,3 list.

ENDL 153
PDF pg 40, pg 19, 4.13.1.1.4 Rebuild operation
<<devices (except the failed device) in the redundancy group>> [s/b] <<devices in the redundancy group except the failed device>>

ENDL 154
PDF pg 40, pg 19, 4.13.1.1.4 Rebuild operation
<<step 4>> [s/b] <<step 4)>> for consistency with the sentence that follows the 1,2,3 list.

ENDL 155
PDF pg 40, pg 19, 4.13.1.1.4 Rebuild operation
<<XDWRITEREAD command may be sent to the device.>> [s/b] <<XDWRITEREAD command with the DISABLE WRITE bit set to one may be used.>>

ENDL 156
PDF pg 41, pg 20, 4.13.1.2.1 Additional array subsystem considerations overview
<<subsystem, but describes>> [s/b] <<subsystem and describes>>

ENDL 157 Technical
PDF pg 41, pg 20, 4.13.1.2.2 Buffer full status handling
<<has an obligation to retain>> [s/b] <<should retain>>

ENDL 158
PDF pg 41, pg 20, 4.13.1.2.2 Buffer full status handling
<<This locks up part or all (depending on the size of the device's buffer and the size of the XOR data) of the device's buffer space.>> [s/b] <<Depending on the size of the device's buffer and the size of the XOR data, this allocates all or part of the device's buffer space in a manner that the device is unable to control until receipt of the XDREAD command.>>

ENDL 159
PDF pg 41, pg 20, 4.13.1.2.2 Buffer full status handling
<<that command>> [s/b] <<those commands>>

ENDL 160
PDF pg 41, pg 20, 4.13.1.2.2 Buffer full status handling
<<freed for other commands>> [s/b] <<freed for allocation by other commands>>

ENDL 161
PDF pg 41, pg 20, 4.13.1.2.2 Buffer full status handling
<<is a>> [s/b] <<is in a>>

ENDL 162
PDF pg 41, pg 20, 4.13.1.2.2 Buffer full status handling
<<initiator>> [s/b] <<initiator device>>

ENDL 163
PDF pg 41, pg 20, 4.13.1.2.2 Buffer full status handling
<<may retry the command in the same manner that a command ending with TASK SET FULL status would be retried including>> [s/b] <<may retry the command in the same manner that it would a command that returns a TASK SET FULL status, including>>

ENDL 164
PDF pg 41, pg 20, 4.13.1.2.2 Buffer full status handling
<<buffer full condition. The storage array controller may issue multiple XDWRITEREAD commands, since the device controls when it accepts more write data and provides read data.>> [s/b] <<buffer full condition, since the device controls when it accepts more write data and provides read data.>> The storage array controller may issue multiple XDWRITE commands too. There is nothing special about XDWRITEREAD in that regard.

ENDL 165
PDF pg 41, pg 20, 4.13.1.2.3 Access to an inconsistent stripe
<<strips of consecutively addressed storage from>> [s/b] <<extents (see 3.1.7) on>>

ENDL 166
PDF pg 41, pg 20, 4.13.1.2.3 Access to an inconsistent stripe
<<A strip is an equal division of the storage capacity in a set of consecutively addressed LBAs on a single block device.>> If the change in the previous sentence is accepted, then there is no need for a definition of strip and this sentence/definition can be deleted.

ENDL 167
PDF pg 41, pg 20, 4.13.1.2.3 Access to an inconsistent stripe
Insert a paragraph break before <<When the storage array controller issues ...>> to separate the definitions from the model.

ENDL 168
PDF pg 41, pg 20, 4.13.1.2.3 Access to an inconsistent stripe
<<make sure>> [s/b] <<ensure>>

ENDL 169
PDF pg 41, pg 20, 4.13.1.2.3 Access to an inconsistent stripe
Insert a paragraph break before <<The storage controller shall...>> to separate the model from the requirements.

ENDL 170
PDF pg 41, pg 20, 4.13.1.2.3 Access to an inconsistent stripe
<<in one case>> [s/b] <<in one case that is specific to the commands described by this model>>

ENDL 171
PDF pg 41, pg 20, 4.13.1.2.3 Access to an inconsistent stripe
<<XDWRITE>> [s/b] <<XDWRITE command>>

ENDL 172
PDF pg 41, pg 20, 4.13.1.2.3 Access to an inconsistent stripe
Insert a paragraph break before <<A storage array controller...>> because I think one is needed.

ENDL 173
PDF pg 41, pg 20, 4.13.1.2.3 Access to an inconsistent stripe
<<has been updated>> [s/b] <<may have been updated>> This change is suggested in an attempt to clarify what is different between WRITE and XDWRITE.

ENDL 174
PDF pg 41, pg 20, 4.13.1.3 Error handling considerations
<<failing device and the extent of the failure, then limit access>> [s/b] <<failing device, the scope of the failure, and limit access>> Note 'extent' a glossary defined term in this standard.

ENDL 175
PDF pg 41, pg 20, 4.13.1.3 Error handling considerations

<<not addressed by this standard>> [s/b] <<beyond the scope of this standard>>

ENDL 176 Technical
PDF pg 42, pg 21, 4.13.1.3 Error handling considerations
<<Subclause 4.13.1.3.2 Primary errors - errors resulting directly from the primary command>> This entire subclause belongs in SCC-2 not in SBC-2. If the subclause is not remove then something must be done about <The first class of errors ...>> because there is no second class of errors. Next, 'primary target' and 'secondary command' must be defined. Then, 'parity error' should be changed to 'service delivery subsystem error'. Finally, it must be explained how the result of a service delivery subsystem error during the transfer of a status byte can effectively be changed to a CHECK CONDITIONS status. If the subclause is deleted (as recommended), then the heading for <<4.13.1.3.1 Error handling considerations overview>> should also be removed.

ENDL 177
PDF pg 42, pg 21, 4.13.1.4 XOR data retention requirements
<<while awaiting>> [s/b] <<awaiting>>

ENDL 178
PDF pg 42, pg 21, 4.13.1.4 XOR data retention requirements
<<logical unit reset>> [s/b] <<a logical unit reset event or hard reset event>>

ENDL 179
PDF pg 42, pg 21, 4.13.1.4 XOR data retention requirements
<<I_T nexus loss involving the initiator which sent>> [s/b] <<an I_T nexus loss event associated with the I_T nexus that sent>>

ENDL 180
PDF pg 42, pg 21, 4.13.1.4 XOR data retention requirements
<<d) CLEAR TASK SET;
e) ABORT TASK if the task matches the pending XDREAD; or
f) ABORT TASK SET.>>
[s/b]
<<d) processing of any of the following task management functions (see SAM-3):
A) LOGICAL UNIT RESET;
B) CLEAR TASK SET;
C) ABORT TASK SET; or
D) ABORT TASK for a pending XDREAD.>>

ENDL 181
PDF pg 42, pg 21, 4.14.1 START STOP UNIT and power conditions overview
<<any START STOP UNIT command's power condition specification>> [s/b]
<<the power condition specified by any START STOP UNIT>>

ENDL 182
PDF pg 42, pg 21, 4.14.1 START STOP UNIT and power conditions overview
<<initiator>> [s/b] <<application client>>

ENDL 183
PDF pg 44, pg 23, 4.14.2.3.3 Transition SSU_PC1:Active to SSU_PC3:Standby
<<STANDBY);>> [s/b] <<STANDBY;>>

ENDL 184
PDF pg 45, pg 24, 4.14.2.4.3 Transition SSU_PC2:Idle to SSU_PC3:Standby
<<and expired>> [s/b] <<and zero>> for consistency with 4.14.2.3.3

ENDL 185
PDF pg 45, pg 24, 4.14.2.6.1 SSU_PC4:Stopped state description
<<sense key of>> [s/b] <<sense key set to>>

ENDL 186
PDF pg 45, pg 24, 4.14.2.6.1 SSU_PC4:Stopped state description
<<additional sense code of>> [s/b] <<additional sense code set to>>

ENDL 187
PDF pg 46, pg 25, 4.15.1 Protection information overview
<<any object along the I_T_L nexus>> [s/b] <<any object associated with the I_T_L nexus>>

ENDL 188
PDF pg 46, pg 25, 4.15.1 Protection information overview
<<(e.g., write to medium, store in non-volatile memory, recalculate on read back)>> [s/b] <<(e.g., written to medium, stored in non-volatile memory, recalculated on read back)>> to maintain consistency with the modified verb 'retained'

ENDL 189
PDF pg 46, pg 25, 4.15.1 Protection information overview
<<overwritten (e.g., power loss, hard reset, logical unit reset, and I_T nexus loss have no effect on the retention of protection information)>>
This is not an example. Change to <<overwritten. Power loss, hard reset, logical unit reset, and I_T nexus loss shall have no effect on the retention of protection information.>>

ENDL 190
PDF pg 46, pg 25, 4.15.1 Protection information overview
<<application client buffer>> [2 instances in this paragraph] is not a glossary defined term, either in this standard or in SAM-3. Either A) change to <<data-in buffer and data-out buffer>>, B) change the first occurrence to <<application client buffer (i.e., the data-in buffer or data-out buffer), or C) add a glossary entry for application client buffer reading approximately as follows <<3.1.x application client buffer: Either a data-in buffer or a data-out buffer.>>

ENDL 191
PDF pg 47, pg 26, 4.15.2 Protection information format
<<CRC>> add CRC to the abbreviations list in 3.2

ENDL 192
PDF pg 47, pg 26, 4.15.2 Protection information format
<<application client data buffer>> [2 instances in this paragraph] is not a glossary defined term, either in this standard or in SAM-3. Either A) change to <<data-in buffer and data-out buffer>>, B) change the first occurrence to <<application client data buffer (i.e., the data-in buffer or data-out buffer), or C) add a glossary entry for application client buffer reading approximately as follows <<3.1.x application client buffer: Either a data-in buffer or a data-out buffer.>> and change the two occurrences of <<application client data buffer>> to <<application client buffer>

ENDL 193
PDF pg 48, pg 27, 4.15.2 Protection information format
<<polynomials.>> [s/b] <<polynomials used to generate the logical block guard from the contents of the USER DATA field.>>

ENDL 194
PDF pg 50, pg 29, 4.15.3.4 CRC test cases
<<Several test cases>> [s/b] <<Several CRC test cases>>

ENDL 195
PDF pg 50, pg 29, 4.15.4 Application of protected data
<<supported then>> [s/b] <<supported, then>>

ENDL 196
PDF pg 50, pg 29, 4.15.4 Application of protected data
<<information then>> [s/b] <<information, then>> [2 times in this 1,2,3 list

ENDL 197
PDF pg 50, pg 29, 4.15.4 Application of protected data
The first letters of entries in this 1,2,3 list should be lower case for consistency with previous lists in this standard.

ENDL 198
PDF pg 50, pg 29, 4.15.5 Protected data commands

<<that result in the return of the length>> [s/b] <<that return of the length>>

ENDL 199
PDF pg 50, pg 29, 4.15.5 Protected data commands
<<user data>> [s/b] <<USER DATA field>>

ENDL 200 Technical
PDF pg 50, pg 29, 4.16 Grouping function
<<outside the scope of this standard (i.e., the>> [s/b] <<outside the scope of this standard (e.g., the>> ... assuming that the transmission of collected information is not the only thing that is outside the scope of this standard

ENDL 201
PDF pg 50, pg 29, 4.16 Grouping function
<<An example of how grouping could be used would be if two applications use a subsystem;>> [s/b] <<As an example of how grouping functions could be used consider a subsystem composed of two applications;>> Note: any change the removes the 'if' is acceptable. This example not close to an if/then situation.

ENDL 202
PDF pg 51, pg 30, 5.1 Commands for direct-access devices overview
<<protection information>> [s/b] <<protection information (see 4.15)>>

ENDL 203 Technical
PDF pg 54, pg 33, 5.1 Commands for direct-access devices overview
<<If either PERSISTENT RESERVE IN or PERSISTENT RESERVE OUT is implemented, both shall be implemented.>> This requirement belongs in SPC-3, not in SBC-2.

ENDL 204
PDF pg 54, pg 33, 5.1 Commands for direct-access devices overview
Per the ISO style guide, the table footnotes and notes must appear at the bottom of every page containing table 9. The table notes must appear first and must be separated from the table footnotes by the same separator (i.e., a double line) that separates the header from the body of the table. Also the double line must be present on the bottom of each continuation page of the table.

ENDL 205
PDF pg 54, pg 33, 5.1 Commands for direct-access devices overview
<<remaining operation codes for direct-access devices>> [s/b] <<operation codes for direct-access devices not specified in this table>>

ENDL 206 Technical
PDF pg 55, pg 34
<<5.2 Variable length CDBs>> This subclause belongs in an informative annex.

ENDL 207 Technical
PDF pg 55, pg 34
<<5.3 Service action CDBs>> This subclause belongs in an informative annex.

ENDL 208
PDF pg 56, pg 35, 5.4.1 FORMAT UNIT command overview
<<received in the last mode parameter block descriptor (see 6.3.2) in a MODE SELECT command (see SPC-3)>> [s/b] <<processed by the most recent MODE SELECT command (see SPC-3) that included a parameter block descriptor (see 6.3.2)>>

ENDL 209
PDF pg 56, pg 35, 5.4.1 FORMAT UNIT command overview
<<new commands>> [s/b] <<commands entered into the task set after the FORMAT UNIT command>>

ENDL 210
PDF pg 56, pg 35, 5.4.1 FORMAT UNIT command overview

<<sense key of>> [s/b] <<sense key set to>>

ENDL 211
PDF pg 56, pg 35, 5.4.1 FORMAT UNIT command overview
<<READY and>> [s/b] <<READY, and>>

ENDL 212
PDF pg 57, pg 36, 5.4.1 FORMAT UNIT command overview
<<additional sense code of>> [s/b] <<additional sense code set to>> [2 times on this page]

ENDL 213
PDF pg 57, pg 36, 5.4.1 FORMAT UNIT command overview
<<sense key of>> [s/b] <<sense key set to>>

ENDL 214
PDF pg 57, pg 36, 5.4.1 FORMAT UNIT command overview
<<A FMTPINFO bit set to one specifies that the device server shall>> [s/b] <<A FMTPINFO bit set to one specifies that the device server shall enable the use of protection information (see 4.15) and>>

ENDL 215
PDF pg 57, pg 36, 5.4.1 FORMAT UNIT command overview
<<LOGICAL BLOCK REFERENCE TAG field in protection information (see 4.15).>> [s/b] <<LOGICAL BLOCK REFERENCE TAG field in protection information (see 4.15.2).>> i.e., application client ownership of the logical block reference tag is discussed only in 4.15.2 and a more direct reference will be more valuable to the reader

ENDL 216
PDF pg 57, pg 36, 5.4.1 FORMAT UNIT command overview
<<FFFFFFFF FFFFFFFFh>> [s/b] <<FFFFFFFF_FFFFFFFFh>> as per the conventions stated in 3.4.

ENDL 217 Technical
PDF pg 57, pg 36, 5.4.1 FORMAT UNIT command overview
[add at the end of the LONGLIST paragraph] If the FMTDATA bit is set to zero, the contents of the LONGLIST bit shall be ignored.

ENDL 218 Technical
PDF pg 57, pg 36, 5.4.1 FORMAT UNIT command overview
<<buffer. The source of defect information is not specified.>> [s/b] <<buffer and the source of defect information, if any, is outside the scope of this standard.>>

ENDL 219 Technical
PDF pg 57, pg 36, 5.4.1 FORMAT UNIT command overview
[add a new paragraph after the second a,b list]] If the FMTDATA bit is set to zero, the contents of the CMPLST bit shall be ignored.

ENDL 220
PDF pg 58, pg 37, 5.4.1 FORMAT UNIT command overview
<<N/A>> add N/A to the abbreviations in 3.2

ENDL 221
PDF pg 58, pg 37, 5.4.1 FORMAT UNIT command overview
<< > >> add > to the list of symbols in 3.2

ENDL 222
PDF pg 58, pg 37, 5.4.1 FORMAT UNIT command overview
In table 14 <<All remaining codes are reserved.>> [s/b] <<Reserved>> The 'All others' in the same row takes care of everything else. See table 21 for an example.

ENDL 223
PDF pg 58, pg 37, 5.4.1 FORMAT UNIT command overview
Per the ISO style guide, in table 14 the table notes must appear first and must be separated from the table footnotes by a double line. The word Notes: must not appear above the table footnotes (per the ISO style guide) because that might cause the reader to believe that the table footnotes are not normative.

ENDL 224
PDF pg 59, pg 38, 5.4.2.1 FORMAT UNIT parameter list overview
<<map out of>> [s/b] <<exclude from>>

ENDL 225
PDF pg 59, pg 38, 5.4.2.2 Parameter list header
<<control bits>> [s/b] <<control information>> There is at least one field in each parameter list header format.

ENDL 226
PDF pg 59, pg 38, 5.4.2.2 Parameter list header
<<these bits>> [s/b] <<these headers>>

ENDL 227
PDF pg 59, pg 38, 5.4.2.2 Parameter list header
<<which>> [s/b] <<that>>

ENDL 228
PDF pg 60, pg 39, 5.4.2.2 Parameter list header
<<which>> [s/b] <<that>>

ENDL 229
PDF pg 60, pg 39, 5.4.2.2 Parameter list header
<<bits in this paragraph>> [s/b] <<bits listed in this paragraph>>

ENDL 230
PDF pg 60, pg 39, 5.4.2.2 Parameter list header
<<the setting of>> [s/b] <<the values of>>

ENDL 231
PDF pg 60, pg 39, 5.4.2.2 Parameter list header
<<perform the action>> [s/b] <<take the action>>

ENDL 232 Technical
PDF pg 60, pg 39, 5.4.2.2 Parameter list header
<<The PLIST is not deleted.>> [s/b] <<The PLIST shall not be altered based on the value of the DPRY bit.>>

ENDL 233
PDF pg 60, pg 39, 5.4.2.2 Parameter list header
<<while processing the FORMAT UNIT command>> If this phrase is necessary here, then it is necessary in every sentence defining every behavior of the FORMAT UNIT command. Better to delete it once than to add it everywhere.

ENDL 234
PDF pg 60, pg 39, 5.4.2.2 Parameter list header
<<nor>> [s/b] <<or>> for consistency with the DPRY bit definition

ENDL 235
PDF pg 60, pg 39, 5.4.2.2 Parameter list header
<<the first condition>> [s/b] <<the condition described in item a)>> [2 times, in this paragraph and the next]

ENDL 236
PDF pg 60, pg 39, 5.4.2.2 Parameter list header
<<the second condition>> [s/b] <<the condition described in item b)>> [2 times, in this paragraph and the next]

ENDL 237
PDF pg 61, pg 40, 5.4.2.2 Parameter list header
<<in the parameter list header>> All the fields described in this subclause are in the parameter list header. Delete this redundant information.

ENDL 238 Technical
PDF pg 61, pg 40, 5.4.2.2 Parameter list header
<<The length of the defect list varies with the format of the address descriptors.>> This statement is not appropriate in a T10 standard and should be deleted.

ENDL 239
PDF pg 61, pg 40, 5.4.2.2 Parameter list header
<<sense key of>> [s/b] <<sense key set to>>

ENDL 240
PDF pg 61, pg 40, 5.4.2.2 Parameter list header
<<additional sense code of>> [s/b] <<additional sense code set to>>

ENDL 241
PDF pg 62, pg 41, 5.4.2.3 Initialization pattern descriptor
<<(i.e.>> [s/b] <<(i.e.,>>

ENDL 242
PDF pg 63, pg 42, 5.4.2.3 Initialization pattern descriptor
<<table 20>> [s/b] <<table 19>> The IP modifier field is described in table 19, not table 20.

ENDL 243
PDF pg 63, pg 42, 5.4.2.3 Initialization pattern descriptor
<<Notes:>> This line should be deleted since (per the ISO style guide) in indicates that the paragraphs below it are not normative, as opposed to the normative paragraphs that appear as table footnoted in table 20.

ENDL 244
PDF pg 64, pg 43, 5.4.2.4.2 Short block format address descriptor
<<value above the capacity>> [s/b] <<value that is greater than the capacity>> [2 times, once here and once in 5.4.2.4.3]

ENDL 245
PDF pg 64, pg 43, 5.4.2.4.4 Bytes from index format address descriptor
<<by this descriptor>> should be deleted for consistency with the description of the SECTOR NUMBER field in 5.4.2.4.5.

ENDL 246
PDF pg 65, pg 44, 5.4.2.4.5 Physical sector format address descriptor
<<a sector>> [s/b] <<one sector>> for consistency with the 'one track' phrase earlier in this sentence.

ENDL 247
PDF pg 65, pg 44, 5.5 LOCK UNLOCK CACHE (10) command
<<range>> [s/b] <<extent (see 3.1.17)>>

ENDL 248
PDF pg 66, pg 45, 5.5 LOCK UNLOCK CACHE (10) command
<<range>> [s/b] <<extent>> [4 times in this subclause on this page]

ENDL 249
PDF pg 66, pg 45, 5.5 LOCK UNLOCK CACHE (10) command
<<contiguous logical blocks within the range>> [s/b] <<logical blocks in the extent>>

ENDL 250
PDF pg 66, pg 45, 5.5 LOCK UNLOCK CACHE (10) command
<<range contains all remaining logical blocks>> [s/b] <<extent contains all logical blocks from the one specified in the LOGICAL BLOCK ADDRESS field to the largest valued LBA>>

ENDL 251 Technical
PDF pg 66, pg 45, 5.5 LOCK UNLOCK CACHE (10) command
<<initiator port>> [s/b] <<I_T nexus>> and <<initiator ports>> [s/b] <<I_T nexuses> [3 instances total in this paragraph]

ENDL 252
PDF pg 66, pg 45, 5.6 LOCK UNLOCK CACHE (16) command
<<range>> [s/b] <<extent (see 3.1.17)>>

ENDL 253
PDF pg 66, pg 45, 5.6 LOCK UNLOCK CACHE (16) command
<<for a description>> [s/b] <<for the definition>> Standards describe things, but more importantly they define things.

ENDL 254
PDF pg 67, pg 46, 5.7 PRE-FETCH (10) command
<<a>> [s/b] <<the>> Unless there is more than one definition of the LOGICAL BLOCK ADDRESS field

ENDL 255
PDF pg 67, pg 46, 5.7 PRE-FETCH (10) command
<<block device's>> What other cache memory would it be? Delete this unnecessary phrase.

ENDL 256
PDF pg 67, pg 46, 5.7 PRE-FETCH (10) command
<<all remaining logical blocks>> [s/b] <<all logical blocks from the one specified in the LOGICAL BLOCK ADDRESS field to the largest valued LBA>>

ENDL 257
PDF pg 67, pg 46, 5.7 PRE-FETCH (10) command
<<ine>> [s/b] <<one>>

ENDL 258
PDF pg 68, pg 47, 5.8 PRE-FETCH (16) command
<<for a description>> [s/b] <<for the definition>>

ENDL 259
PDF pg 68, pg 47, 5.9 READ (6) command
<<addressed logical block>> [s/b] <<addressed logical blocks>>

ENDL 260
PDF pg 69, pg 48, 5.9 READ (6) command
<<The LOGICAL BLOCK ADDRESS field specifies the logical block where the read operation shall begin.>> [s/b] <<See the LOCK UNLOCK CACHE (10) command (see 5.5) for a definition of the LOGICAL BLOCK ADDRESS field.>>

ENDL 261
PDF pg 69, pg 48, 5.9 READ (6) command
It seem like note 10 should precede note 9 so that it is closer to the definition of the TRANSFER LENGTH field.

ENDL 262
PDF pg 70, pg 49, 5.9 READ (6) command
<<the sense key shall>> [s/b] <<the status shall be CHECK CONDITION and the sense key shall>>

ENDL 263
PDF pg 70, pg 49, 5.9 READ (6) command
<<for a description>> [s/b] <<for the definition>>

ENDL 264
PDF pg 71, pg 50, 5.10 READ (10) command
<<a>> [s/b] <<the>>

ENDL 265
PDF pg 71, pg 50, 5.10 READ (10) command
<<for a description>> [s/b] <<for the definition>>

ENDL 266
PDF pg 71, pg 50, 5.10 READ (10) command
Per the ISO style guide, there should be a double line at the bottom of each page in table 33.

ENDL 267 Technical
PDF pg 72, pg 51, 5.10 READ (10) command
<<Shall not>> Does 'Shall not' in the Extended INQUIRY VPD page column of table 33 mean that the page shall not be supported?

ENDL 268
PDF pg 73, pg 52, 5.10 READ (10) command
<<fail>> [s/b] <<terminate>> [2 times on this page]

ENDL 269

PDF pg 73, pg 52, 5.10 READ (10) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 270
PDF pg 73, pg 52, 5.10 READ (10) command
<<additional sense code of>> [s/b] <<additional sense code set to>> [2 times on this page]

ENDL 271
PDF pg 73, pg 52, 5.10 READ (10) command
<<the sense key shall>> [s/b] <<the status shall be CHECK CONDITION and the sense key shall>>

ENDL 272
PDF pg 73, pg 52, 5.10 READ (10) command
<<for a description>> [s/b] <<for the definition>>

ENDL 273
PDF pg 73, pg 52, 5.10 READ (10) command
<<cache>> [s/b] <<cache memory>>

ENDL 274
PDF pg 74, pg 53, 5.10 READ (10) command
<<cache>> [s/b] <<cache memory>> [9 times in this table]

ENDL 275
PDF pg 74, pg 53, 5.10 READ (10) command
<<first>> is redundant with <<before>> Delete one or the other. [2 times in table 34]

ENDL 276
PDF pg 75, pg 54, 5.11 READ (12) command
<<Restricted for MMC-4>> [s/b] <<Restricted (see MMC-4)>> for consistency with table 93.

ENDL 277
PDF pg 75, pg 54, 5.11 READ (12) command
<<for a description>> [s/b] <<for the definition>>

ENDL 278
PDF pg 75, pg 54, 5.12 READ (16) command
<<Restricted for MMC-4>> [s/b] <<Restricted (see MMC-4)>> for consistency with table 93.

ENDL 279
PDF pg 75, pg 54, 5.12 READ (16) command
<<for a description>> [s/b] <<for the definition>>

ENDL 280
PDF pg 76, pg 55, 5.13 READ (32) command
<<for a description>> [s/b] <<for the definition>>

ENDL 281
PDF pg 76, pg 55, 5.13 READ (32) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 282
PDF pg 76, pg 55, 5.13 READ (32) command
<<checking enables and requirements>> [s/b] <<checking requirements>> [2 times in this paragraph]

ENDL 283
PDF pg 76, pg 55, 5.13 READ (32) command
<<are controlled by>> [s/b] <<are specified by>>

ENDL 284
PDF pg 76, pg 55, 5.13 READ (32) command
<<a definition description>> [s/b] <<the definition>>

ENDL 285
PDF pg 76, pg 55, 5.13 READ (32) command

<<for this command>> What other command would it be? Delete this. [2 times on this page]

ENDL 286
PDF pg 76, pg 55, 5.13 READ (32) command
<<of the range of logical blocks>> [s/b] <<in the extent (3.1.17)>>

ENDL 287
PDF pg 77, pg 56, 5.14 READ CAPACITY (10) command
<<a>> [s/b] <<the>>

ENDL 288
PDF pg 78, pg 57, 5.14 READ CAPACITY (10) command
<<initiator>> [s/b] <<application client>>

ENDL 289
PDF pg 78, pg 57, 5.15 READ CAPACITY (16) command
<<a>> [s/b] <<the>>

ENDL 290
PDF pg 78, pg 57, 5.15 READ CAPACITY (16) command
<<for a description>> [s/b] <<for the definition>>

ENDL 291
PDF pg 79, pg 58, 5.15 READ CAPACITY (16) command
<<FFFFFFFF FFFFFFFEh>> [s/b] <<FFFFFFFF_FFFFFFFEh>> per the conventions in 3.4.

ENDL 292
PDF pg 80, pg 59, 5.16 READ DEFECT DATA (10) command
<<default format (see the DEFECT LIST FORMAT field in the defect list header)>> [s/b] <<default format and indicate that format in the DEFECT LIST FORMAT field (see table 43)>>

ENDL 293
PDF pg 80, pg 59, 5.16 READ DEFECT DATA (10) command
<<Short block format address descriptors and long block format address descriptors returned with this command are vendor-specific.>> The intent of this sentence is unclear. Maybe <<The use of short block format address descriptors and long block format address descriptors by this command is vendor-specific.>> is correct, maybe not.

ENDL 294
PDF pg 81, pg 60, 5.16 READ DEFECT DATA (10) command
<<but contains>> [s/b] <<but the ALLOCATION LENGTH field contains>>

ENDL 295
PDF pg 81, pg 60, 5.16 READ DEFECT DATA (10) command
<<create a CHECK CONDITION status>> [s/b] <<return a CHECK CONDITION status>>

ENDL 296 Technical
PDF pg 81, pg 60, 5.16 READ DEFECT DATA (10) command
Is note 16 really useful? If the size of the defect list exceeds the allocation length of a READ DEFECT DATA(12) command, there is no way at all to determine the number of defects.

ENDL 297
PDF pg 81, pg 60, 5.16 READ DEFECT DATA (10) command
<<READ DEFECT DATA (10) command with an ALLOCATION LENGTH of four>> [s/b] <<READ DEFECT DATA (12) command with an ALLOCATION LENGTH of eight>> since READ DEFECT DATA(12) has a greater probability of being able to represent the defect list in the capacity of the ALLOCATION LENGTH field.

ENDL 298
PDF pg 81, pg 60, 5.16 READ DEFECT DATA (10) command
<<The address descriptors>> [s/b] <<The address descriptors (see 5.4.2.4)>>

ENDL 299

PDF pg 81, pg 60, 5.16 READ DEFECT DATA (10) command
<<The application client may determine the exact number of the defects by dividing the DEFECT LIST LENGTH by the length of a single address descriptor for the returned format.>> Delete this. The second sentence on this page says the same thing better.

ENDL 300
PDF pg 81, pg 60, 5.17 READ DEFECT DATA (12) command
<<for a description>> [s/b] <<for the definition>>

ENDL 301
PDF pg 82, pg 61, 5.17 READ DEFECT DATA (12) command
<<See the description of the READ DEFECT DATA (10) list header (see 5.16) for a description of the fields in this header.>> [s/b] <<See the READ DEFECT DATA (10) command for the definition the fields in this defect list.>>

ENDL 302
PDF pg 82, pg 61, 5.18 READ LONG (10) command
<<The data passed>> [s/b] <<The data transferred>>

ENDL 303
PDF pg 82, pg 61, 5.18 READ LONG (10) command
<<See the LOCK UNLOCK CACHE (10) command (see 5.5) for a definition of the LOGICAL BLOCK ADDRESS field.>> The LOCK UNLOCK CACHE(10) defines the LOGICAL BLOCK ADDRESS field as specifying the first logical block in an extent. That definition is correct for READ LONG only if the length of the extent is one. It is not clear that a reference to 5.5 is appropriate here.

ENDL 304
PDF pg 83, pg 62, 5.19 READ LONG (16) command
<<See the READ LONG (10) command (see 5.18) for a description of the fields in this command.>> [s/b] <<See the READ LONG (10) command (see 5.18) for the definition of the fields in this command and the data transferred by this command.>>

ENDL 305
PDF pg 83, pg 62, 5.20 REASSIGN BLOCKS command
[Global in REASSIGN BLOCKS] Since the address descriptors used by REASSIGN BLOCKS are not the same as the address descriptors used by FORMAT UNIT, READ DEFECT DATA, and elsewhere, consideration should be given to changing the name. 'Logical block address descriptor' is one possibility.

ENDL 306
PDF pg 83, pg 62, 5.20 REASSIGN BLOCKS command
<<the defective logical blocks>> [s/b] <<defective logical blocks>>

ENDL 307
PDF pg 83, pg 62, 5.20 REASSIGN BLOCKS command
<<GLIST if such a list is supported>> [s/b] <<GLIST, if the list is supported>> or <<GLIST, if supported>>

ENDL 308
PDF pg 83, pg 62, 5.20 REASSIGN BLOCKS command
<<More than one physical or logical block may be relocated by each address descriptor sent by the application client.>> This sentence is not strictly correct. Since 'each address descriptor' can specify exactly one logical block, it seems unlikely that more than one logical block can be relocated in response to one (aka 'each') address descriptor.

ENDL 309
PDF pg 83, pg 62, 5.20 REASSIGN BLOCKS command
<<list that contains the LBAs>> [s/b] <<list that contains address descriptors [or whatever] identifying the LBAs>>

ENDL 310
PDF pg 84, pg 63, 5.20 REASSIGN BLOCKS command
<<FFFFFFFF FFFFFFFFh>> [s/b] <<FFFFFFFF_FFFFFFFFh>> for consistency with

3.4

ENDL 311
PDF pg 85, pg 64, 5.20 REASSIGN BLOCKS command
<<ascending order>> [s/b] <<ascending order by LBA value>>

ENDL 312
PDF pg 85, pg 64, 5.20 REASSIGN BLOCKS command
<<FFFFFFFF FFFFFFFFh>> [s/b] <<FFFFFFFF_FFFFFFFFh>> for consistency with 3.4

ENDL 313
PDF pg 85, pg 64, 5.20 REASSIGN BLOCKS command
<<unexpected unrecoverable read error>> [s/b] <<unrecoverable read error>> Surely, errors are never expected.

ENDL 314
PDF pg 85, pg 64, 5.20 REASSIGN BLOCKS command
It seems like note 18 should not be a note.

ENDL 315
PDF pg 85, pg 64, 5.21 START STOP UNIT command
<<The START STOP UNIT command provides>> [s/b] <<The START STOP UNIT command (see table 52) provides>> Also delete the paragraph immediately before table 52 ... for consistency with the other command descriptions in this standard

ENDL 316
PDF pg 85, pg 64, 5.21 START STOP UNIT command
<<certain>> [s/b] <<specified>>

ENDL 317
PDF pg 85, pg 64, 5.21 START STOP UNIT command
<<unit, the same as they would do in response to a SYNCHRONIZE CACHE command with the SYNC_NV bit set to zero (see 5.22), prior>> [s/b] <<unit (e.g., as they would do in response to a SYNCHRONIZE CACHE command with the SYNC_NV bit set to zero (see 5.22)) prior>>

ENDL 318
PDF pg 85, pg 64, 5.21 START STOP UNIT command
<<a hard drive stops its spindle motor>> [s/b] <<the rotating media spindle motor is stopped>> for consistency with 4.12

ENDL 319
PDF pg 86, pg 65, 5.21 START STOP UNIT command
<<POWER CONDITION>> [s/b] <<POWER CONDITIONS>> as per table 52 and other text in this subclause

ENDL 320
PDF pg 86, pg 65, 5.21 START STOP UNIT command
Delete <<optional>> Since I can find no way to omit the POWER CONDITIONS field from the CDB, it seems unlikely that the field is optional.

ENDL 321
PDF pg 86, pg 65, 5.21 START STOP UNIT command
<<has>> [s/b] <<contains>>

ENDL 322
PDF pg 86, pg 65, 5.21 START STOP UNIT command
<<Oh then>> [s/b] <<Oh, then>> i.e., add a comma between the if clause and the then clause

ENDL 323
PDF pg 86, pg 65, 5.21 START STOP UNIT command
The device server may ignore the contents of the POWER CONDITIONS field.

ENDL 324
PDF pg 86, pg 65, 5.21 START STOP UNIT command
<<are valid>> [s/b] <<shall be processed>>

ENDL 325

PDF pg 86, pg 65, 5.21 START STOP UNIT command
<<is issued>> [s/b] <<is received>> or <<is processed>> [3 times on this page]

ENDL 326
PDF pg 86, pg 65, 5.21 START STOP UNIT command
<<command or a logical unit reset>> [s/b] <<command, a logical unit reset event, or receipt of a LOGICAL UNIT RESET task management function>>

ENDL 327
PDF pg 86, pg 65, 5.21 START STOP UNIT command
<<idle condition and standby condition timers>> [s/b] <<idle condition timer and standby condition timer>>

ENDL 328
PDF pg 86, pg 65, 5.21 START STOP UNIT command
<<or a logical unit reset occurs>> [s/b] <<a LOGICAL UNIT RESET task management function is received, or a logical unit reset event occurs>>

ENDL 329
PDF pg 86, pg 65, 5.21 START STOP UNIT command
<<START STOP UNIT command's most recent power condition setting>> [s/b] <<specified power condition>> for consistency with item a) in the same list

ENDL 330
PDF pg 86, pg 65, 5.21 START STOP UNIT command
<<selected>> [s/b] <<specified>> [2 times in list entry a)]

ENDL 331
PDF pg 86, pg 65, 5.21 START STOP UNIT command
<<a power condition in which it currently is>> [s/b] <<the same power condition that is currently in effect>>

ENDL 332
PDF pg 87, pg 66, 5.21 START STOP UNIT command
Either add <<(see SPC-3)>> here Or delete (see SPC-3) from the paragraph defining LU_CONTROL on the previous page.

ENDL 333
PDF pg 87, pg 66, 5.21 START STOP UNIT command
<<activated>> [s/b] <<active>> for consistency with terminology used everywhere else in this subclause

ENDL 334
PDF pg 87, pg 66, 5.22 SYNCHRONIZE CACHE (10) command
<<range>> [s/b] <<extent (see 3.1.17)>>

ENDL 335
PDF pg 87, pg 66, 5.22 SYNCHRONIZE CACHE (10) command
<<cache>> [s/b] <<cache memory>>

ENDL 336
PDF pg 87, pg 66, 5.22 SYNCHRONIZE CACHE (10) command
<<implicitly by>> [s/b] <<to be performed as part of >>

ENDL 337
PDF pg 87, pg 66, 5.22 SYNCHRONIZE CACHE (10) command
<<SCSI functions>> [s/b] <<functions>>

ENDL 338
PDF pg 87, pg 66, 5.22 SYNCHRONIZE CACHE (10) command
<<in other clauses of>> [s/b] <<elsewhere in>> strictly speaking the current wording prohibits requirements for SYNCHRONIZE CACHE usage from appearing anywhere in this clause, i.e., clause 5, and invalidates statements made in the START STOP UNIT command definition.

ENDL 339
PDF pg 87, pg 66, 5.22 SYNCHRONIZE CACHE (10) command
<<a>> [s/b] <<the>>

ENDL 340
PDF pg 87, pg 66, 5.22 SYNCHRONIZE CACHE (10) command
<<for a description>> [s/b] <<for the definition>>

ENDL 341
PDF pg 87, pg 66, 5.22 SYNCHRONIZE CACHE (10) command
<<The SYNC_NV bit specifies>> [s/b] <<The SYNC_NV bit (see table 55) specifies>> and Delete <<and is described in table 55>> at the end of the sentence.

ENDL 342
PDF pg 87, pg 66, 5.22 SYNCHRONIZE CACHE (10) command
<<No requirement.>> Remove period from the end of this non-sentence.

ENDL 343
PDF pg 88, pg 67, 5.22 SYNCHRONIZE CACHE (10) command
<<contiguous logical blocks within the range>> [s/b] <<logical blocks in the extent>>

ENDL 344
PDF pg 88, pg 67, 5.22 SYNCHRONIZE CACHE (10) command
<<range>> [s/b] <<extent>> [3 times on this page]

ENDL 345
PDF pg 88, pg 67, 5.22 SYNCHRONIZE CACHE (10) command
Why is the LOCK UNLOCK CACHE (10) command (see 5.5) definition for the NUMBER OF BLOCKS field incorrect for SYNCHRONIZE CACHE(10)?

ENDL 346
PDF pg 88, pg 67, 5.23 SYNCHRONIZE CACHE (16) command
<<cache>> [s/b] <<cache memory>>

ENDL 347
PDF pg 88, pg 67, 5.23 SYNCHRONIZE CACHE (16) command
<<implicitly by>> [s/b] <<to be performed as part of >>

ENDL 348
PDF pg 88, pg 67, 5.23 SYNCHRONIZE CACHE (16) command
<<SCSI functions>> [s/b] <<functions>>

ENDL 349
PDF pg 88, pg 67, 5.23 SYNCHRONIZE CACHE (16) command
<<in other clauses of>> [s/b] <<elsewhere in>>

ENDL 350
PDF pg 88, pg 67, 5.23 SYNCHRONIZE CACHE (16) command
<<for a description>> [s/b] <<for the definition>>

ENDL 351
PDF pg 88, pg 67, 5.24 VERIFY (10) command
<<log read capacity data>> [s/b] <<long read capacity data>>

ENDL 352
PDF pg 89, pg 68, 5.24 VERIFY (10) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 353
PDF pg 89, pg 68, 5.24 VERIFY (10) command
<<additional sense code of>> [s/b] <<additional sense code set to>>

ENDL 354
PDF pg 89, pg 68, 5.24 VERIFY (10) command
<<Restricted for MMC-4>> [s/b] <<Restricted (see MMC-4)>> for consistency with table 93.

ENDL 355
PDF pg 89, pg 68, 5.24 VERIFY (10) command
<<for a description>> [s/b] <<for the definition>> [2 times in this paragraph]

ENDL 356
PDF pg 89, pg 68, 5.24 VERIFY (10) command
<<a>> [s/b] <<the>>

ENDL 357
PDF pg 89, pg 68, 5.24 VERIFY (10) command
<<If the MODE SELECT command is implemented, and the Verify Error Recovery mode page (see 6.3.5) is also implemented,>> [s/b] <<If the Verify Error Recovery mode page (see 6.3.5) is implemented,>> for consistency with the rest of the standard

ENDL 358
PDF pg 89, pg 68, 5.24 VERIFY (10) command
<<specifies>> [s/b] <<specify>> to match the number of the sentence subject (i.e., settings)

ENDL 359 Technical
PDF pg 90, pg 69, 5.24 VERIFY (10) command
<<Shall not>> Does 'Shall not' in the Extended INQUIRY VPD page column of table 58 and table 59 mean that the page shall not be supported?

ENDL 360
PDF pg 90, pg 69, 5.24 VERIFY (10) command
There should be a double line at the bottom of each page of table 58, table 60, and table 61.

ENDL 361
PDF pg 92, pg 71, 5.24 VERIFY (10) command
<<fail>> [s/b] <<terminate>> [2 times on this page]

ENDL 362
PDF pg 92, pg 71, 5.24 VERIFY (10) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 363
PDF pg 92, pg 71, 5.24 VERIFY (10) command
<<additional sense code of>> [s/b] <<additional sense code set to>>

ENDL 364
PDF pg 92, pg 71, 5.24 VERIFY (10) command
<<for a description>> [s/b] <<for the definition>>

ENDL 365
PDF pg 93, pg 72, 5.24 VERIFY (10) command
<<fail>> [s/b] <<terminate>> [2 times on this page]

ENDL 366
PDF pg 93, pg 72, 5.24 VERIFY (10) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 367
PDF pg 93, pg 72, 5.24 VERIFY (10) command
<<additional sense code of>> [s/b] <<additional sense code set to>>

ENDL 368
PDF pg 93, pg 72, 5.24 VERIFY (10) command
<<for a description>> [s/b] <<for the definition>>

ENDL 369
PDF pg 95, pg 74, 5.24 VERIFY (10) command
<<fail>> [s/b] <<terminate>> [2 times on this page]

ENDL 370
PDF pg 95, pg 74, 5.24 VERIFY (10) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 371
PDF pg 95, pg 74, 5.24 VERIFY (10) command
<<additional sense code of>> [s/b] <<additional sense code set to>>

ENDL 372

PDF pg 97, pg 76, 5.24 VERIFY (10) command
<<fail>> [s/b] <<terminate>> [2 times on this page]

ENDL 373
PDF pg 97, pg 76, 5.24 VERIFY (10) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 374
PDF pg 97, pg 76, 5.24 VERIFY (10) command
<<additional sense code of>> [s/b] <<additional sense code set to>>

ENDL 375
PDF pg 97, pg 76, 5.25 VERIFY (12) command
<<log read capacity data>> [s/b] <<long read capacity data>>

ENDL 376
PDF pg 98, pg 77, 5.25 VERIFY (12) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 377
PDF pg 98, pg 77, 5.25 VERIFY (12) command
<<additional sense code of>> [s/b] <<additional sense code set to>>

ENDL 378
PDF pg 98, pg 77, 5.25 VERIFY (12) command
<<Restricted for MMC-4>> [s/b] <<Restricted (see MMC-4)>> for
consistency with table 93.

ENDL 379
PDF pg 98, pg 77, 5.25 VERIFY (12) command
<<for a description>> [s/b] <<for the definition>>

ENDL 380
PDF pg 98, pg 77, 5.26 VERIFY (16) command
<<log read capacity data>> [s/b] <<long read capacity data>>

ENDL 381
PDF pg 98, pg 77, 5.26 VERIFY (16) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 382
PDF pg 98, pg 77, 5.26 VERIFY (16) command
<<additional sense code of>> [s/b] <<additional sense code set to>>

ENDL 383
PDF pg 98, pg 77, 5.26 VERIFY (16) command
<<Restricted for MMC-4>> [s/b] <<Restricted (see MMC-4)>> for
consistency with table 93.

ENDL 384
PDF pg 98, pg 77, 5.26 VERIFY (16) command
<<for a description>> [s/b] <<for the definition>>

ENDL 385
PDF pg 99, pg 78, 5.27 VERIFY (32) command
<<for a description>> [s/b] <<for the definition>>

ENDL 386
PDF pg 99, pg 78, 5.27 VERIFY (32) command
The text describing the RTO_EN bit appears between the subclause heading
and the CDB format table for all the other VERIFY(n) commands. Be
consistent.

ENDL 387
PDF pg 99, pg 78, 5.27 VERIFY (32) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 388
PDF pg 99, pg 78, 5.27 VERIFY (32) command
<<checking enables and requirements>> [s/b] <<checking requirements>> [2
times in this paragraph]

ENDL 389
PDF pg 99, pg 78, 5.27 VERIFY (32) command
<<are controlled by>> [s/b] <<are specified by>>

ENDL 390
PDF pg 99, pg 78, 5.27 VERIFY (32) command
<<a definition description>> [s/b] <<the definition>>

ENDL 391
PDF pg 99, pg 78, 5.27 VERIFY (32) command
<<of the range of logical blocks>> [s/b] <<in the extent (3.1.17)>> [on this page and the next]

ENDL 392
PDF pg 100, pg 79, 5.27 VERIFY (32) command
Delete <<for this command>>

ENDL 393
PDF pg 100, pg 79, 5.28 WRITE (6) command
<<The LOGICAL BLOCK ADDRESS field specifies the logical block where the write operation shall begin.>> [s/b] <<See the LOCK UNLOCK CACHE (10) command (see 5.5) for a definition of the LOGICAL BLOCK ADDRESS field.>>

ENDL 394
PDF pg 100, pg 79, 5.28 WRITE (6) command
<<the logical block>> [s/b] <<each logical block>>

ENDL 395
PDF pg 100, pg 79, 5.28 WRITE (6) command
<<LBA if>> [s/b] <<LBA, if>>

ENDL 396
PDF pg 100, pg 79, 5.28 WRITE (6) command
<<FFFFFFFFh if>> [s/b] <<FFFFFFFFh, if>>

ENDL 397
PDF pg 100, pg 79, 5.28 WRITE (6) command
<<FFFFh if>> [s/b] <<FFFFh, if>>

ENDL 398
PDF pg 100, pg 79, 5.28 WRITE (6) command
<<any value if>> [s/b] <<any value, if>> This text was what surfaced the need for commas, as I read it.

ENDL 399
PDF pg 101, pg 80, 5.29 WRITE (10) command
<<as required by the WRPROTECT field>> [s/b] <<as specified by the WRPROTECT field>>

ENDL 400
PDF pg 101, pg 80, 5.29 WRITE (10) command
<<a>> [s/b] <<the>> [2 times in this paragraph]

ENDL 401
PDF pg 101, pg 80, 5.29 WRITE (10) command
<<for a description>> [s/b] <<for the definition>>

ENDL 402
PDF pg 101, pg 80, 5.29 WRITE (10) command
<<The force unit access (FUA and FUA_NV) bits are defined in table 67.>> [s/b] <<The force unit access (FUA) and force unit access nonvolatile cache (FUA_NV) bits are defined in table 67.>> Note: the suggested replacement text is a cut and paste from the READ(10) command, with only the table number changed.

ENDL 403
PDF pg 101, pg 80, 5.29 WRITE (10) command
<<cache>> [s/b] <<cache memory>> [4 times in this table]

ENDL 404

PDF pg 102, pg 81, 5.29 WRITE (10) command
In READ(10), the RDPROTECT field is described before the FUA bits. Here the reverse is true. Be consistent.

ENDL 405
PDF pg 102, pg 81, 5.29 WRITE (10) command
There should be a double line at the bottom of each page of table 68.

ENDL 406
PDF pg 103, pg 82, 5.29 WRITE (10) command
<<fail>> [s/b] <<terminate>> [2 times on this page]

ENDL 407
PDF pg 103, pg 82, 5.29 WRITE (10) command
<<sense key of>> [s/b] <<sense key set to>> [2 times on this page]

ENDL 408
PDF pg 103, pg 82, 5.29 WRITE (10) command
<<additional sense code of>> [s/b] <<additional sense code set to>> [2 times on this page]

ENDL 409
PDF pg 104, pg 83, 5.30 WRITE (12) command
<<as required by the WRPROTECT field>> [s/b] <<as specified by the WRPROTECT field>> [2 times on this page]

ENDL 410
PDF pg 104, pg 83, 5.30 WRITE (12) command
<<Restricted for MMC-4>> [s/b] <<Restricted (see MMC-4)>> for consistency with table 93.

ENDL 411
PDF pg 104, pg 83, 5.30 WRITE (12) command
<<for a description>> [s/b] <<for the definition>>

ENDL 412
PDF pg 104, pg 83, 5.31 WRITE (16) command
<<Restricted for MMC-4>> [s/b] <<Restricted (see MMC-4)>> for consistency with table 93.

ENDL 413
PDF pg 104, pg 83, 5.31 WRITE (16) command
<<for a description>> [s/b] <<for the definition>>

ENDL 414
PDF pg 105, pg 84, 5.32 WRITE (32) command
<<for a description>> [s/b] <<for the definition>>

ENDL 415
PDF pg 105, pg 84, 5.32 WRITE (32) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 416
PDF pg 105, pg 84, 5.32 WRITE (32) command
<<checking enables and requirements>> [s/b] <<checking requirements>> [2 times in this paragraph]

ENDL 417
PDF pg 105, pg 84, 5.32 WRITE (32) command
<<are controlled by>> [s/b] <<are specified by>>

ENDL 418
PDF pg 105, pg 84, 5.32 WRITE (32) command
<<a definition description>> [s/b] <<the definition>>

ENDL 419
PDF pg 105, pg 84, 5.32 WRITE (32) command
<<for this command>> What other command would it be? Delete this. [2 times on this page]

ENDL 420

PDF pg 105, pg 84, 5.32 WRITE (32) command
<<of the range of logical blocks>> [s/b] <<in the extent (3.1.17)>>

ENDL 421
PDF pg 106, pg 85, 5.33 WRITE AND VERIFY (10) command
<<as required by the WRPROTECT field>> [s/b] <<as specified by the WRPROTECT field>> [2 times on this page]

ENDL 422
PDF pg 106, pg 85, 5.33 WRITE AND VERIFY (10) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 423
PDF pg 106, pg 85, 5.33 WRITE AND VERIFY (10) command
<<a>> [s/b] <<the>> [2 times in this paragraph]

ENDL 424
PDF pg 106, pg 85, 5.33 WRITE AND VERIFY (10) command
<<for a description>> [s/b] <<for the definition>> [2 times in this paragraph]

ENDL 425
PDF pg 106, pg 85, 5.33 WRITE AND VERIFY (10) command
<<If the MODE SELECT command is implemented, and the Verify Error Recovery mode page (see 6.3.5) is also implemented,>> [s/b] <<If the Verify Error Recovery mode page (see 6.3.5) is implemented,>>

ENDL 426
PDF pg 107, pg 86, 5.34 WRITE AND VERIFY (12) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 427
PDF pg 107, pg 86, 5.34 WRITE AND VERIFY (12) command
<<Restricted for MMC-4>> [s/b] <<Restricted (see MMC-4)>> for consistency with table 93.

ENDL 428
PDF pg 107, pg 86, 5.34 WRITE AND VERIFY (12) command
<<for a description>> [s/b] <<for the definition>>

ENDL 429
PDF pg 107, pg 86, 5.35 WRITE AND VERIFY (16) command
<<as required by the WRPROTECT field>> [s/b] <<as specified by the WRPROTECT field>>

ENDL 430
PDF pg 107, pg 86, 5.35 WRITE AND VERIFY (16) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 431
PDF pg 107, pg 86, 5.35 WRITE AND VERIFY (16) command
<<Restricted for MMC-4>> [s/b] <<Restricted (see MMC-4)>> for consistency with table 93.

ENDL 432
PDF pg 107, pg 86, 5.35 WRITE AND VERIFY (16) command
<<for a description>> [s/b] <<for the definition>>

ENDL 433
PDF pg 108, pg 87, 5.36 WRITE AND VERIFY (32) command
<<for a description>> [s/b] <<for the definition>>

ENDL 434
PDF pg 108, pg 87, 5.36 WRITE AND VERIFY (32) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 435
PDF pg 108, pg 87, 5.36 WRITE AND VERIFY (32) command
<<checking enables and requirements>> [s/b] <<checking requirements>> [2 times in this paragraph]

ENDL 436
PDF pg 108, pg 87, 5.36 WRITE AND VERIFY (32) command
<<are controlled by>> [s/b] <<are specified by>>

ENDL 437
PDF pg 108, pg 87, 5.36 WRITE AND VERIFY (32) command
<<a definition description>> [s/b] <<the definition>>

ENDL 438
PDF pg 108, pg 87, 5.36 WRITE AND VERIFY (32) command
<<for this command>> What other command would it be? Delete this. [2 times on this page]

ENDL 439
PDF pg 108, pg 87, 5.36 WRITE AND VERIFY (32) command
<<of the range of logical blocks>> [s/b] <<in the extent (3.1.17)>>

ENDL 440
PDF pg 109, pg 88, 5.37 WRITE LONG (10) command
<<See the LOCK UNLOCK CACHE (10) command (see 5.5) for a definition of the LOGICAL BLOCK ADDRESS field.>> The LOCK UNLOCK CACHE(10) defines the LOGICAL BLOCK ADDRESS field as specifying the first logical block in an extent. That definition is correct for WRITE LONG only if the length of the extent is one. It is not clear that a reference to 5.5 is appropriate here.

ENDL 441
PDF pg 109, pg 88, 5.37 WRITE LONG (10) command
<<can>> [s/b] <<may>>

ENDL 442
PDF pg 110, pg 89, 5.38 WRITE LONG (16) command
<<See the WRITE LONG (10) command (see 5.18) for a description of the fields in this command.>> [s/b] <<See the WRITE LONG (10) command (see 5.18) for the definition of the fields in this command and the data transferred by this command.>>

ENDL 443
PDF pg 110, pg 89, 5.39 WRITE SAME (10) command
<<as required by the WRPROTECT field>> [s/b] <<as specified by the WRPROTECT field>>

ENDL 444
PDF pg 110, pg 89, 5.39 WRITE SAME (10) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 445
PDF pg 110, pg 89, 5.39 WRITE SAME (10) command
<<a>> [s/b] <<the>>

ENDL 446
PDF pg 110, pg 89, 5.39 WRITE SAME (10) command
<<for a description>> [s/b] <<for the definition>>

ENDL 447
PDF pg 111, pg 90, 5.39 WRITE SAME (10) command
<<Into each of the following logical blocks>> [s/b] <<For each subsequent logical block>> Otherwise the use of 'into' is redundant in the sentence.

ENDL 448 Technical
PDF pg 111, pg 90, 5.39 WRITE SAME (10) command
<<The device server shall replace the first four bytes of the block received from the application client data-out buffer with the least significant four bytes of the LBA of the block being written. The most significant byte of the four bytes shall be written first.>> If the least significant four bytes are written, how can the most significant <<four bytes>> be written first?

ENDL 449
PDF pg 111, pg 90, 5.39 WRITE SAME (10) command

<<FFFFFFFF FFFFFFFFh>> [s/b] <<FFFFFFFF_FFFFFFFFh>> for consistency with 3.4

ENDL 450
PDF pg 111, pg 90, 5.39 WRITE SAME (10) command
<<all the remaining logical blocks on the medium>> [s/b] <<all the logical blocks from the one specified in the LOGICAL BLOCK ADDRESS field to the largest valued LBA>>

ENDL 451
PDF pg 111, pg 90, 5.40 WRITE SAME (16) command
<<as required by the WRPROTECT field>> [s/b] <<as specified by the WRPROTECT field>>

ENDL 452
PDF pg 112, pg 91, 5.40 WRITE SAME (16) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 453
PDF pg 112, pg 91, 5.40 WRITE SAME (16) command
<<for a description>> [s/b] <<for the definition>>

ENDL 454
PDF pg 113, pg 92, 5.41 WRITE SAME (32) command
<<for a description>> [s/b] <<for the definition>>

ENDL 455
PDF pg 113, pg 92, 5.41 WRITE SAME (32) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 456
PDF pg 113, pg 92, 5.41 WRITE SAME (32) command
<<checking enables and requirements>> [s/b] <<checking requirements>> [2 times in this paragraph]

ENDL 457
PDF pg 113, pg 92, 5.41 WRITE SAME (32) command
<<are controlled by>> [s/b] <<are specified by>>

ENDL 458
PDF pg 113, pg 92, 5.41 WRITE SAME (32) command
<<a>> [s/b] <<the>>

ENDL 459
PDF pg 113, pg 92, 5.41 WRITE SAME (32) command
<<for this command>> What other command would it be? Delete this. [2 times on this page]

ENDL 460
PDF pg 113, pg 92, 5.41 WRITE SAME (32) command
<<of the range of logical blocks>> [s/b] <<in the extent (3.1.17)>>

ENDL 461
PDF pg 114, pg 93, 5.42 XDREAD (10) command
<<target transfer to the initiator>> [s/b] <<device server transfer to the application client>>

ENDL 462
PDF pg 114, pg 93, 5.42 XDREAD (10) command
<<as required by the XORPINFO bit>> [s/b] <<as specified by the XORPINFO bit>>

ENDL 463
PDF pg 114, pg 93, 5.42 XDREAD (10) command
<<for a description>> [s/b] <<for the definition>>

ENDL 464
PDF pg 114, pg 93, 5.42 XDREAD (10) command
<<fields>> [s/b] <<protection information fields>>

ENDL 465

PDF pg 114, pg 93, 5.42 XDREAD (10) command
Insert new paragraph for consistency with XPWRITE command definition. [2 times on this page]

ENDL 466
PDF pg 114, pg 93, 5.42 XDREAD (10) command
<<sense key of>> [s/b] <<sense key set to>> [2 times in this paragraph]

ENDL 467
PDF pg 114, pg 93, 5.42 XDREAD (10) command
<<additional sense code of>> [s/b] <<additional sense code set to>> [2 times in this paragraph]

ENDL 468
PDF pg 114, pg 93, 5.42 XDREAD (10) command
<<is terminated>> [s/b] <<shall be terminated>>

ENDL 469
PDF pg 115, pg 94, 5.43 XDREAD (32) command
<<target transfer to the initiator>> [s/b] <<device server transfer to the application client>>

ENDL 470
PDF pg 115, pg 94, 5.43 XDREAD (32) command
<<as required by the XORPINFO bit>> [s/b] <<as specified by the XORPINFO bit>>

ENDL 471
PDF pg 115, pg 94, 5.43 XDREAD (32) command
<<for a description>> [s/b] <<for the definition>>

ENDL 472
PDF pg 115, pg 94, 5.44 XDWRITE (10) command
<<target>> [s/b] <<device server>> [2 times in this paragraph]

ENDL 473
PDF pg 115, pg 94, 5.44 XDWRITE (10) command
<<as required by the WRPROTECT field>> [s/b] <<as specified by the WRPROTECT field>>

ENDL 474
PDF pg 116, pg 95, 5.44 XDWRITE (10) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 475
PDF pg 116, pg 95, 5.44 XDWRITE (10) command
<<a>> [s/b] <<the>> [1 time each in this paragraph and the next]

ENDL 476
PDF pg 116, pg 95, 5.44 XDWRITE (10) command
The first three paragraphs after table 84 should be agglomerated into one paragraph, for consistency with the rest of the standard.

ENDL 477
PDF pg 116, pg 95, 5.44 XDWRITE (10) command
<<for a description>> [s/b] <<for the definition>>

ENDL 478
PDF pg 116, pg 95, 5.45 XDWRITE (32) command
<<target>> [s/b] <<device server>> [2 times in this paragraph]

ENDL 479
PDF pg 116, pg 95, 5.45 XDWRITE (32) command
<<as required by the WRPROTECT field>> [s/b] <<as specified by the WRPROTECT field>>

ENDL 480
PDF pg 117, pg 96, 5.45 XDWRITE (32) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 481

PDF pg 117, pg 96, 5.45 XDWRITE (32) command
<<for a description>> [s/b] <<for the definition>>

ENDL 482
PDF pg 117, pg 96, 5.46 XDWRITEREAD (10) command
<<target>> [s/b] <<device server>>

ENDL 483
PDF pg 117, pg 96, 5.46 XDWRITEREAD (10) command
<<as required by the WRPROTECT field>> [s/b] <<as specified by the WRPROTECT field>>

ENDL 484
PDF pg 118, pg 97, 5.46 XDWRITEREAD (10) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 485
PDF pg 118, pg 97, 5.46 XDWRITEREAD (10) command
<<for a description>> [s/b] <<for the definition>>

ENDL 486
PDF pg 118, pg 97, 5.47 XDWRITEREAD (32) command
<<target>> [s/b] <<device server>>

ENDL 487
PDF pg 118, pg 97, 5.47 XDWRITEREAD (32) command
<<as required by the WRPROTECT field>> [s/b] <<as specified by the WRPROTECT field>>

ENDL 488
PDF pg 119, pg 98, 5.47 XDWRITEREAD (32) command
<<sense key of>> [s/b] <<sense key set to>>

ENDL 489
PDF pg 119, pg 98, 5.47 XDWRITEREAD (32) command
<<for a description>> [s/b] <<for the definition>>

ENDL 490
PDF pg 119, pg 98, 5.48 XPWRITE (10) command
<<target>> [s/b] <<device server>>

ENDL 491
PDF pg 119, pg 98, 5.48 XPWRITE (10) command
<<as required by the XORPINFO bit>> [s/b] <<as specified by the XORPINFO bit>>

ENDL 492
PDF pg 120, pg 99, 5.48 XPWRITE (10) command
<<a>> [s/b] <<the>> [2 times in this paragraph]

ENDL 493
PDF pg 120, pg 99, 5.48 XPWRITE (10) command
<<for a description>> [s/b] <<for the definition>>

ENDL 494
PDF pg 120, pg 99, 5.48 XPWRITE (10) command
<<sense key of>> [s/b] <<sense key set to>> [3 times on this page]

ENDL 495
PDF pg 120, pg 99, 5.48 XPWRITE (10) command
<<additional sense code of>> [s/b] <<additional sense code set to>> [3 times on this page]

ENDL 496
PDF pg 120, pg 99, 5.48 XPWRITE (10) command
<<fields>> [s/b] <<protection information fields>>

ENDL 497
PDF pg 120, pg 99, 5.48 XPWRITE (10) command
<<target>> [s/b] <<device server>> [2 times on this page]

ENDL 498
PDF pg 121, pg 100, 5.49 XPWRITE (32) command
<<as required by the XORPINFO bit>> [s/b] <<as specified by the XORPINFO bit>>

ENDL 499
PDF pg 121, pg 100, 5.49 XPWRITE (32) command
<<for a description>> [s/b] <<for the definition>>

ENDL 500
PDF pg 122, pg 101, 6.1.2 Translate Address Output diagnostic page
<<passed>> [s/b] <<sent>> I would have said <<transferred>> but <<sent>> is more consistent with the usage of <<returned>> later in this paragraph.

ENDL 501
PDF pg 122, pg 101, 6.1.2 Translate Address Output diagnostic page
<<page sent>> [s/b] <<page (see table 19) is sent>> for consistency with the next sentence.

ENDL 502
PDF pg 123, pg 102, 6.1.2 Translate Address Output diagnostic page
<<address>> [s/b] <<address descriptor>>

ENDL 503
PDF pg 124, pg 103, 6.1.2 Translate Address Output diagnostic page
Delete <<different>> because it adds no value.

ENDL 504
PDF pg 126, pg 105, 6.2.2 Format Status log page
<<Vendor-specific parameters>> [s/b] <<Vendor-specific>>

ENDL 505
PDF pg 126, pg 105, 6.2.2 Format Status log page
<<FORMAT DATA OUT field>> [s/b] <<Format DATA OUT parameter>>

ENDL 506
PDF pg 126, pg 105, 6.2.2 Format Status log page
<<of the most recently successful>> [s/b] <<from the most recent successful>>

ENDL 507
PDF pg 126, pg 105, 6.2.2 Format Status log page
<<GROWN DEFECTS DURING CERTIFICATION field>> [s/b] <<grown defects during certification parameter>>

ENDL 508 Technical
PDF pg 126, pg 105, 6.2.2 Format Status log page
<<a FORMAT UNIT command>> [s/b] <<the most recent successful FORMAT UNIT command>>

ENDL 509
PDF pg 126, pg 105, 6.2.2 Format Status log page
<<TOTAL BLOCKS REALLOCATED DURING FORMAT field>> [s/b] <<total blocks reallocated during format parameter>>

ENDL 510
PDF pg 126, pg 105, 6.2.2 Format Status log page
<<last>> [s/b] <<most recent>>

ENDL 511 Technical
PDF pg 126, pg 105, 6.2.2 Format Status log page
Some text appears to be missing. 1) There is no description for the total new blocks reallocated parameter. 2) The existing definition of the total blocks reallocated during format parameter would fit better as the definition of the total new blocks reallocated parameter.

ENDL 512
PDF pg 126, pg 105, 6.2.2 Format Status log page
<<minutes (i.e., power applied regardless of power state)>> [s/b] <<minutes with power applied regardless of power state>>

ENDL 513
PDF pg 126, pg 105, 6.2.2 Format Status log page
<<reflect no such information being available>> [s/b] <<indicate that no such information is available>>

ENDL 514
PDF pg 126, pg 105, 6.2.2 Format Status log page
<<manner and location>> [s/b] <<manner>>

ENDL 515
PDF pg 127, pg 106, 6.2.3 Non-volatile Cache log page
<<defined in table 95>> [s/b] <<(see table 95)>>

ENDL 516
PDF pg 127, pg 106, 6.2.3 Non-volatile Cache log page
<<(either permanently or temporarily, e.g.,>> [s/b] <<(either permanently or temporarily (e.g.,>>

ENDL 517
PDF pg 132, pg 111, 6.3.2.3 Long LBA mode parameter block descriptor
<<FFFFFFFF FFFFFFFFh>> [s/b] <<FFFFFFFF_FFFFFFFFh>> for consistency with 3.4 [2 times on this page]

ENDL 518
PDF pg 133, pg 112, 6.3.3 Caching mode page
<<use the>> [s/b] <<use either the>> to help the 'dependent on' phrase make more sense

ENDL 519
PDF pg 134, pg 113, 6.3.3 Caching mode page
<<WRITE RETENTION PRIORITY field>> [s/b] <<WRITE RETENTION PRIORITY field (see table 106)>>

ENDL 520
PDF pg 134, pg 113, 6.3.3 Caching mode page
<<cache>> [s/b] <<cache memory>> [2 times in this paragraph]

ENDL 521 Technical
PDF pg 134, pg 113, 6.3.3 Caching mode page
<<All the following parameters give an indication to the device server how it should manage the cache based on the last READ command.>> Is this statement true for any of the following fields: FSW, LBCSS, DRA, NUMBER OF CACHE SEGMENTS, CACHE SEGMENT SIZE, NV_DIS, or NON CACHE SEGMENT SIZE? It appears that fields have been appended to the page contents since the time that this statement was written.

ENDL 522
PDF pg 134, pg 113, 6.3.3 Caching mode page
<<last>> [s/b] <<most recent>>

ENDL 523
PDF pg 134, pg 113, 6.3.3 Caching mode page
<<remaining>> [s/b] <<following>>

ENDL 524 Technical
PDF pg 134, pg 113, 6.3.3 Caching mode page
<<All the remaining caching parameters are only recommendations to the device server ...>> Is this statement true for any of the following fields: FSW, LBCSS, DRA, NUMBER OF CACHE SEGMENTS, CACHE SEGMENT SIZE, NV_DIS, or NON CACHE SEGMENT SIZE? It appears that fields have been appended to the page contents since the time that this statement was written.

ENDL 525
PDF pg 134, pg 113, 6.3.3 Caching mode page
<<the current>> [s/b] <<a>>

ENDL 526
PDF pg 135, pg 114, 6.3.3 Caching mode page
Delete <<previous>> I do not think any replacement wording is needed,

but if some is it would be <<most recent>>

ENDL 527
PDF pg 135, pg 114, 6.3.3 Caching mode page
<<before exceeding the end of>> [s/b] <<largest LBA on>>

ENDL 528
PDF pg 135, pg 114, 6.3.3 Caching mode page
Delete <<current>>

ENDL 529
PDF pg 135, pg 114, 6.3.3 Caching mode page
<<rules for reporting deferred errors>> [s/b] <<rules for reporting deferred errors (see SPC-3)>>

ENDL 530
PDF pg 135, pg 114, 6.3.3 Caching mode page
<<ready to be processed>> [s/b] <<in the task set>>

ENDL 531
PDF pg 135, pg 114, 6.3.3 Caching mode page
Delete <<into the cache>> Pre-fetch is defined to use cache memory (see previous page) and besides 'cache' s/b 'cache memory'

ENDL 532
PDF pg 135, pg 114, 6.3.3 Caching mode page
Perhaps note 24 should not be a note.

ENDL 533 Technical
PDF pg 135, pg 114, 6.3.3 Caching mode page
<<bytes>> [s/b] <<bytes, if the LBCSS bit is set to zero, or in logical blocks if the LBCSS bit is set to one>>

ENDL 534
PDF pg 135, pg 114, 6.3.3 Caching mode page
<<buffer function>> [s/b] <<buffer function (e.g., [insert an example of a buffer function here]>>

ENDL 535
PDF pg 135, pg 114, 6.3.3 Caching mode page
<<caching functions in the other segments need not be>> [s/b] <<other uses of cache memory are not>>

ENDL 536
PDF pg 135, pg 114, 6.3.3 Caching mode page
<<SCSI buffer function>> [s/b] <<buffer function>>

ENDL 537
PDF pg 136, pg 115, 6.3.4 Read-Write Error Recovery mode page
<<Restricted for MMC-4>> [s/b] <<Restricted (see MMC-4)>> for consistency with table 93.

ENDL 538
PDF pg 136, pg 115, 6.3.4 Read-Write Error Recovery mode page
<<to be performed during write operations>> [s/b] <<of defective logical blocks during write operations>> to be consistent with the previous sentence

ENDL 539
PDF pg 137, pg 116, 6.3.4 Read-Write Error Recovery mode page
<<of mis-detection>> [s/b] <<of error mis-detection>>

ENDL 540
PDF pg 137, pg 116, 6.3.4 Read-Write Error Recovery mode page
In keeping with the usage elsewhere in this standard, note 26 should be a table footnote in table 108.

ENDL 541
PDF pg 138, pg 117, 6.3.4 Read-Write Error Recovery mode page
<<sense key of>> [s/b] <<sense key set to>> [2 times on this page]

ENDL 542
PDF pg 139, pg 118, 6.3.4 Read-Write Error Recovery mode page
<<sense key of>> [s/b] <<sense key set to>>

ENDL 543
PDF pg 140, pg 119, 6.3.4 Read-Write Error Recovery mode page
<<READ and WRITE RETRY COUNT fields>> [s/b] <<READ RETRY COUNT field and WRITE RETRY COUNT field>>

ENDL 544
PDF pg 140, pg 119, 6.3.4 Read-Write Error Recovery mode page
Delete <<If the RETRY COUNT field and the RECOVERY TIME LIMIT field are both specified in a MODE SELECT command, the field that requires the least time for data error recovery actions shall have priority.>> The last sentence in the paragraph says the same thing.

ENDL 545
PDF pg 140, pg 119, 6.3.4 Read-Write Error Recovery mode page
<<If both RETRY COUNT and RECOVERY TIME LIMIT are specified, the field>> [s/b] <<When choosing between retry counts and recovery time limits, the condition>>

ENDL 546
PDF pg 140, pg 119, 6.3.5 Verify Error Recovery mode page
Delete <<If the verify retry count and the VERIFY RECOVERY TIME LIMIT are both specified, the one that requires the least time for data error recovery actions shall have priority.>> The last sentence of the next paragraph says the same thing.

ENDL 547
PDF pg 140, pg 119, 6.3.5 Verify Error Recovery mode page
Insert a paragraph break for consistency with the Read-Write Error Recovery mode page definition.

ENDL 548
PDF pg 140, pg 119, 6.3.5 Verify Error Recovery mode page
Is note 27 necessary? If it is, does it belong 6.3.4 too?

ENDL 549
PDF pg 141, pg 120, 6.3.6 XOR Control mode page
<<initiator>> [s/b] <<application client>>

ENDL 550
PDF pg 141, pg 120, 6.3.6 XOR Control mode page
<<target>> [s/b] <<device server>> [2 times on this page]

ENDL 551
PDF pg 141, pg 120, 6.3.6 XOR Control mode page
<<is sent to the logical unit,>> [s/b] <<is received,>>

ENDL 552
PDF pg 142, pg 121, 6.4.2 Block Limits VPD page
<<sense key of>> [s/b] <<sense key set to>>

ENDL 553
PDF pg 142, pg 121, 6.4.2 Block Limits VPD page
<<additional sense code of>> [s/b] <<additional sense code set to>>

****

Comments attached to Abs ballot from Elwood Parsons of
Foxconn Electronics:

Abstain due to lack of expertise.

****

Comments attached to Yes ballot from Rob Elliott of
Hewlett Packard Co.:

HPQ #1
PDF Page iv
ANSI page
Change 2003 to 2004

HPQ #2
PDF Page 10
4 Models
Need to mention format corrupted and the
additional sense code that results
from media access commands when the medium
is in
that state.

HPQ #3
PDF Page 11
4.4 Logical blocks
Add a unit
attention and a new additional sense code CAPACITY DATA HAS
CHANGED whenever
any of the READ CAPACITY
data changes (number of blocks, block size, or
various protection
information settings).

HPQ #4
PDF Page 18
4.13 Model for
XOR commands
Move 4.13.1.nn to 4.13.2, 4.13.3, etc. to eliminate hanging
paragraph and
unnecessary nesting

HPQ #5
PDF Page 30
5.1 Commands overview

To require that SBC-2 devices support long LBAs and deprecate usage of
short
LBAs...
a) change READ (6) and READ (10) from mandatory to optional in table
9 and
in note 9
b) change READ CAPACITY (10) from mandatory to optional in
table 9
c) mark each of these commands as mandatory in table 9 if any of
their
smaller counterparts are implemented (the same rule that
currently

exists for WRITE (16)):
LOCK UNLOCK CACHE (16)
PRE-FETCH (16)
READ DEFECT
DATA (12)
READ LONG (16)
SYNCHRONIZE CACHE (16)
VERIFY (16)
WRITE AND
VERIFY (16)
WRITE LONG (16)
WRITE SAME (16)
XDREAD (32)
XDWRITE (32)

XDWRITEREAD (32)
XPWRITE (32)

HPQ #6
PDF Page 30

5.1 Commands overview
To
not require that SBC-2 devices support long LBAs...
a) change READ (16) from
mandatory to optional in
table 9
b) change WRITE (16) from mandatory (if any
WRITE is supported) to optional
in table 9 and remove footnote d

HPQ #7
PDF
Page 88
5.37 WRITE LONG (10) command
Delete "NOTE 21 - Any other bytes that
can be corrected by ECC should be
included (e.g., a data synchronization
mark
within the area covered by ECC). A READ LONG command may be issued
before
issuing a WRITE LONG command."
Let READ LONG define the complete contents of
the data.

HPQ #8
PDF Page 108
6.3.1 Mode parameters overview
Table 102

after "Management" add "mode page"

HPQ #9
PDF Page 109
6.3.2.1 Mode
parameter block descriptors overview
After:
A unit attention condition
add:

with an additional sense code set to MODE PARAMETERS CHANGED

****

Comments attached to No ballot from George O. Penokie of
IBM Corp.:

IBM #1
PDF Page vi
Revision Information
This section needs to be removed before going to public review.

IBM #2
PDF Page 1
1 Scope
This information is not necessary << (this bit was formerly reserved for
direct-access device types, so is just marked
reserved in this standard); >>

IBM #3
PDF Page 3
2.1 Normative references overview
This should be << (e.g., including BSI, JIS, and DIN).

IBM #4
PDF Page 3
2.1 Normative references overview
This should be << (i.e., ISO, IEC, CEN/CENELEC, ITUT); >>

IBM #5

PDF Page 5
3.1.8 command descriptor block (CDB):
This should be << server. See SPC-3. >>. The space is missing.

IBM #6
PDF Page 6
3.1.25 logical unit reset event:
This << logical unit as described in SAM-3. >> should be << logical unit.
See SAM-3. >>

IBM #7
PDF Page 6
3.1.28 non-volatile medium:
This << cycles. An example of this is a disk within a device that stores
data as magnetic field changes that do not
require device power to exist. >> should be << cycles (e.g., a disk within a
device that stores data as magnetic field
changes that do not require device power to exist). >>

IBM #8
PDF Page 7
3.1.44 volatile medium:
This << power cycles. An example of this is a silicon memory device that
loses data written to it if device power is lost.
>> should be << power cycles (e.g.,a silicon memory device that loses data
written to it if device power is lost). >>

IBM #9
PDF Page 10
4.2 Direct-access device type model overview
This << and can be read without >> should be << and are able to be read
without >>

IBM #10
PDF Page 10
4.3.1 Removable medium overview
This << cartridge (or jacket) to prevent >> should be << cartridge or jacket
to prevent >>
4.3.2 Removable medium with an attached medium changer
This << Only one medium transport element is permitted (element 0) and only
one data transfer element is permitted.
>> should be deleted as it not relevant to this standard and should instead
be in SMC-2.

IBM #12
PDF Page 11
4.4 Logical blocks
This << A READ CAPACITY command may be issued to determine the value of
[n-1]. >> should be changed to << A
READ CAPACITY command should be issued to determine the value of [n-1]. >>.
The reason is that we are trying to
encourage the use of READ CAPACITY.

IBM #13
PDF Page 11
4.4 Logical blocks
This << The READ CAPACITY data (see 5.14) describes the block lengths that
are
used on the medium. >> should be << The parameter data returned by the READ
CAPACITY command (see 5.14)
describes the block lengths that are
used on the medium. >>

IBM #14
PDF Page 11
4.5 Ready state
This << commands can be processed. >> should be << commands are able to be
processed. >>

IBM #15
PDF Page 12

4.6 Initialization
This << Parameters related to the geometry and performance characteristics
may be set with the MODE SELECT
command prior to the format operation. >> is not really true now that we
have eliminated the geometry and the format
device mode pages, therefore it should be deleted.

IBM #16
PDF Page 12
4.6 Initialization
This << After changing the mode parameter block descriptor with MODE SELECT,
the new values do not become
effective until FORMAT UNIT command completes. >> is a gross
oversimplification that is not accurate in all cases.
The best thing to do is delete it as everything is correctly defined in the
mode page header descriptions.

IBM #17
PDF Page 12
4.8 Medium defects
This << defects that can cause user data >> should be << defects that may
cause user data >>

IBM #18
PDF Page 12
4.8 Medium defects
This << (to reference while formatting) >> states no useful information and
should be deleted or at least made into an
(e.g., ...) to indicate an example of what it could be used for.

IBM #19
PDF Page 13
4.8 Medium defects
This << this manner can be specified in the >> should be << this manner may
be specified in the >>

IBM #20
PDF Page 13
4.9 Cache memory
This << block and can increase the overall data >> should be << block and
may increase the overall data >>

IBM #21
PDF Page 13
4.9 Cache memory
This << VERIFY and WRITE AND VERIFY commands >> should be << VERIFY command
or WRITE AND VERIFY
command >>

IBM #22
PDF Page 14
4.9 Cache memory
This << VERIFY command or WRITE AND VERIFY >> should be << VERIFY command or
WRITE AND VERIFY
command >>

IBM #23
PDF Page 14
4.10 Reservations
This << enters the current task state for the first time. >> should be <<
enters the current task state (see SAM-3) for
the first time. >>

IBM #24
PDF Page 15
Table 3
Global
Having tables with footnotes were the footnote do no occur at every page
break makes it difficult to the reader to find
the footnote or even know if there are any footnote. The footnotes should be
changed to appear on every page. Also,

not have a line at the end of each page break is confusing. It looks like
something is missing from the table.

IBM #25
PDF Page 16
4.11 Error reporting
This << a READ LONG or WRITE LONG command did >> should be << a READ LONG
command or WRITE LONG
command did >>

IBM #26
PDF Page 17
4.11 Error reporting
Table 5
All the command names should have << command >> after them.

IBM #27
PDF Page 17
4.12.1 Examples overview
The statement << The following examples show some typical variations >>
should be << This clause describes
examples of some typical variations >>

IBM #28
PDF Page 17
4.12.2 Rotating media
This << tracks that can be accessed without >> should be << tracks that are
accessed without >>

IBM #29
PDF Page 17
4.12.2 Rotating media
This <<formatted at the factory. >> should be << formatted by the
manufacture. >>

IBM #30
PDF Page 18
4.12.2 Rotating media
This <<some aspects can be evaluated and controlled >> should be << some
aspects may be evaluated and
controlled >>

IBM #31
PDF Page 18
4.12.2 Rotating media
This << The READ LONG and WRITE LONG commands >> should be << The READ LONG
command and WRITE
LONG command >>

IBM #32
PDF Page 18
4.12.2 Rotating media
This << when generating mirror
copies.o >> should be << when generating mirror copies. >> as there is no
reason to quote that phrase.

IBM #33
PDF Page 18
4.13.1.1.1 Storage array controller supervised XOR operations overview
This << XDWRITE, XPWRITE, and XDREAD.>> should be an a,b,c list or at least
<< XDWRITE command,
XPWRITE command, and XDREAD command.>>

IBM #34
PDF Page 18
4.13.1.1.1 Storage array controller supervised XOR operations overview
This << XDWRITE followed by XDREAD.>> should be << XDWRITE command followed
by XDREAD command.>>

IBM #35
PDF Page 18

4.13.1.1.1 Storage array controller supervised XOR operations overview
This << uses READ and WRITE commands for >> should be << uses READ commands
and WRITE commands for
>>

IBM #36
PDF Page 19
4.13.1.1.2 Update write operation (storage array controller supervised)
This << XOR data (received in the previous XDREAD command) to the >> should
be << XOR data (i.e., XOR data
received in the previous XDREAD command) to the >>
4.13.1.1.3 Regenerate operation (storage array controller supervised)
This << all devices (except the failed device) in the redundancy >> should
be << all devices, except the failed device,
in the redundancy

IBM #38
PDF Page 19
4.13.1.1.4 Rebuild operation (storage array controller supervised)
This << all devices (except the failed device) in the redundancy >> should
be << all devices, except the failed device,
in the redundancy

IBM #39
PDF Page 20
4.13.1.2.1 Additional array subsystem considerations overview
This << to any array subsystem, but describes how use of the XOR >> does not
read very well. I think it should be <<
to any array subsystem, and describes how use of the XOR >>

IBM #40
PDF Page 20
4.13.1.2.2 Buffer full status handling
This << This locks up part or all (depending on the size of the devices
buffer and the size of the XOR data) of the
deviceAs buffer space. >> should be << Depending on the size of the deviceAs
buffer and the size of the XOR data,
this locks up part or all of the deviceAs buffer space. >>

IBM #41
PDF Page 20
4.13.1.2.3 Access to an inconsistent stripe
This << updated (making the stripe consistent again). >> should be <<
updated (i.e., making the stripe consistent
again). >>

IBM #42
PDF Page 21
4.13.1.3.2 Primary errors - errors resulting directly from the primary
command
This << primary command (primary target) and are not due >> should be <<
primary command (i.e., primary target)
and are not due >>

IBM #43
PDF Page 22
4.14.2.1 START STOP UNIT and power conditions state machine overview
Figure 2
This << but may have additional characteristics unique to this standard. >>
sounds like we don't know what our own
standards have in them. Either SPC-3 have additional characteristics or not.
I think the <<may>> should be deleted.

IBM #44
PDF Page 22
4.14.2.2.1 SSU_PCO:Powered_on state description
This << This logical unit shall enter this >> should be << The logical unit
shall enter this >>

IBM #45
PDF Page 30

5.1 Commands for direct-access devices overview
This << indicated by the oProtection informationo column. >> should be <<
indicated by the protection information
column. >>

IBM #46
PDF Page 33
5.1 Commands for direct-access devices overview
Table 9
This << If either PERSISTENT RESERVE IN or PERSISTENT RESERVE OUT is
implemented, >> should be << If
either PERSISTENT RESERVE IN command or PERSISTENT RESERVE OUT command is
implemented, >>

IBM #47
PDF Page 33
5.1 Commands for direct-access devices overview
Table 9
This << If any of WRITE (6)/(10)/(12) is implemented, WRITE (16) shall also
be >> should be << If any of WRITE
(6)/(10)/(12) command is implemented, the WRITE (16) command shall also be
>>

IBM #48
PDF Page 35
5.4.1 FORMAT UNIT command overview
This << new commands except INQUIRY, REPORT LUNS, and REQUEST SENSE with a
CHECK >> should be << new commands except INQUIRY command, REPORT LUNS
command , and REQUEST SENSE command with a
CHECK >>

IBM #49
PDF Page 42
5.4.2.4.1 Address descriptor formats overview
This << SEND DIAGNOSTIC and RECEIVE DIAGNOSTIC RESULTS commands. >> should
be << SEND
DIAGNOSTIC command and RECEIVE DIAGNOSTIC RESULTS command. >>

IBM #50
PDF Page 42
5.4.2.4.1 Address descriptor formats overview
This << the FORMAT UNIT and READ DEFECT DATA commands; >> should be << the
FORMAT UNIT command
and READ DEFECT DATA command; >>

IBM #51
PDF Page 45
5.5 LOCK UNLOCK CACHE (10) command
This << memory are actually locked. >> should be << memory are locked. >>

IBM #52
PDF Page 48
5.9 READ (6) command
This << READ (6) command; however, no default values are >> should be <<
READ (6) command. However, no
default values are >>

IBM #53
PDF Page 52
5.10 READ (10) command
Table 33
This << READ (10), READ (12),and READ (16) commands with >> should be << a
READ (10) command, READ (12) command, or READ (16) command with >>

IBM #54
PDF Page 52
5.10 READ (10) command
Table 33
This << READ (10), READ (12), and READ (16) commands >> should be << the
READ (10) command, READ (12)
command, or READ (16) command >>

IBM #55
PDF Page 55
5.13 READ (32) command
For the LOGICAL BLOCK APPLICATION TAG and the LOGICAL BLOCK REFERENCE TAG there is no indication
as to whether the same value that is received is checked against all the LBAs that are read or if it is incremented in
some fashion for each LBA. The current definition seems to imply there is only one value for all the LBAs that are
read. This needs to be made clear.

IBM #56
PDF Page 59
5.16 READ DEFECT DATA (10) command
This is a bad reference as I have no idea where to look for this << (see the DEFECT LIST FORMAT field in the defect
list header). >> it should be << (see table x.x.x for the DEFECT LIST FORMAT field). >>

IBM #57
PDF Page 60
5.16 READ DEFECT DATA (10) command
This << SCSI device >> should be << logical unit >>.

IBM #58
PDF Page 60
5.16 READ DEFECT DATA (10) command
This << SCSI device >> should be << logical unit >>.

IBM #59
PDF Page 62
5.18 READ LONG (10) command
This << the data bytes; however, they should be in the same >> should be << the data bytes. However, they should
be in the same >>

IBM #60
PDF Page 62
5.20 REASSIGN BLOCKS command
This << protection information, if present, >> should be << protection information, if any, >> as it is everywhere else.

IBM #61
PDF Page 63
5.20 REASSIGN BLOCKS command
This << protection information, if present, >> should be << protection information, if any, >> as it is everywhere else.

IBM #62
PDF Page 64
5.20 REASSIGN BLOCKS command
NOTE 18
This note looks like it should be part of the main text instead of a note.

IBM #63
PDF Page 72
5.24 VERIFY (10) command
Table 59; 000b value
The REF_CHK = 1 should have footnote reference to the following footnote:
If the RTO_EN bit is set to zero in the long read capacity data (see 5.15), the device server checks the logical block
reference tag by comparing it to the lower 4 bytes of the LBA associated with the logical block. If the RTO_EN bit is
set to one, the device server checks the logical block reference tag only if it has knowledge of the contents of the
LOGICAL BLOCK REFERENCE TAG field. The method for acquiring this knowledge is not defined by this standard.

IBM #64
PDF Page 78

5.27 VERIFY (32) command
For the LOGICAL BLOCK APPLICATION TAG and the LOGICAL BLOCK REFERENCE TAG there is no indication
as to whether the same value that is received is checked against all the LBAs that are verified or if it is incremented in
some fashion for each LBA. The current definition seems to imply there is only one value for all the LBAs that are
verified. This needs to be made clear.

IBM #65
PDF Page 82
5.29 WRITE (10) command
This <<one, WRITE (10), WRITE (12),and WRITE (16) commands with the WRPROTECT field >> should be <<
<<one, a WRITE (10) command, WRITE (12) command, or WRITE (16) command with the WRPROTECT field >>

IBM #66
PDF Page 82
5.29 WRITE (10) command
This << terminate WRITE (10), WRITE (12), and WRITE (16) commands >> should be << terminate the WRITE (10)
command, WRITE (12) command, or WRITE (16) command >>

IBM #67
PDF Page 84
5.32 WRITE (32) command
For the LOGICAL BLOCK APPLICATION TAG and the LOGICAL BLOCK REFERENCE TAG there is no indication
as to whether the same value that is received is checked against all the LBAs that are read or if it is incremented in
some fashion for each LBA. The current definition seems to imply there is only one value for all the LBAs that are
read. This needs to be made clear.

IBM #68
PDF Page 85
5.33 WRITE AND VERIFY (10) command
This << data and includes protection information as >> should be << data and protection information, if any, as >>
5.34 WRITE AND VERIFY (12) command
This << data and includes protection information as >> should be << data and protection information, if any, as >>

IBM #70
PDF Page 86
5.35 WRITE AND VERIFY (16) command
This << data and includes protection information as >> should be << data and protection information, if any, as >>

IBM #71
PDF Page 87
5.36 WRITE AND VERIFY (32) command
This << protection information, if any. >> should be << protection information, if any, as required by the
WRPROTECT field and the medium format. The data is only transferred once from the application client to the device
server. >>

IBM #72
PDF Page 87
5.36 WRITE AND VERIFY (32) command
This paragraph << If the RTO_EN bit is set to zero in the long read capacity data (see 5.15), the device server shall
terminate the command with CHECK CONDITION status with a sense key of ILLEGAL REQUEST and an additional
sense code set to INVALID COMMAND OPERATION CODE. If the RTO_EN bit is set to one, the device server may
process the command. >> should be move to above table 75. That would make the WRITE AND VERIFY (32) the
same format as the other WRITE AND VERIFY commands.

IBM #73
PDF Page 87
5.36 WRITE AND VERIFY (32) command
For the LOGICAL BLOCK APPLICATION TAG and the LOGICAL BLOCK REFERENCE TAG there is no indication
as to whether the same value that is received is checked against all the LBAs that are verified or if it is incremented in
some fashion for each LBA. The current definition seems to imply there is only one value for all the LBAs that are
verified. This needs to be made clear.

IBM #74
PDF Page 88
5.37 WRITE LONG (10) command
Note 21
This << Any other bytes that can be corrected by ECC >> should be << Any other bytes that are able to be corrected
by ECC >>

IBM #75
PDF Page 88
5.37 WRITE LONG (10) command
The term << exactly >> should be deleted as it adds nothing.

IBM #76
PDF Page 89
5.39 WRITE SAME (10) command
This << data and includes protection information as >> should be << data and protection information, if any, as >>

IBM #77
PDF Page 90
5.39 WRITE SAME (10) command
table 79, row 0 0
There is nothing said about what value should be placed in the Data Block Guard field. This should be fixed. A
statement like this should be added <<The data block guard received in the single block of data shall be placed in the
DATA BLOCK GUARD field of each logical block. >>

IBM #78
PDF Page 90
5.40 WRITE SAME (16) command
This << data and includes protection information as >> should be << data and protection information, if any, as >>

IBM #79
PDF Page 92
5.41 WRITE SAME (32) command
This << protection information, if any. >> should be << protection information, if any, as required by the
WRPROTECT field and the medium format. >>

IBM #80
PDF Page 92
5.41 WRITE SAME (32) command
This paragraph << If the RTO_EN bit is set to zero in the long read capacity data (see 5.15), the device server shall
terminate the command with CHECK CONDITION status with a sense key of ILLEGAL REQUEST and an additional
sense code set to INVALID COMMAND OPERATION CODE. If the RTO_EN bit is set to one, the device server may
process the command. >> should be move to above table 81. That would make the WRITE AND VERIFY (32) the
same format as the other WRITE AND VERIFY commands.

IBM #81
PDF Page 92
5.41 WRITE SAME(32) command
For the LOGICAL BLOCK APPLICATION TAG and the LOGICAL BLOCK REFERENCE TAG

there is no indication
as to whether the same value that is received is written to all the LBAs to
be written or if it is incremented in some
fashion for each LBA. The current definition seems to imply there is only
one value for all the LBAs that are written.
This needs to be made clear.

IBM #82
PDF Page 93
5.42 XDREAD (10) command
This << data and includes protection information as >> should be << data and
protection information, if any, as >>

IBM #83
PDF Page 94
5.4.3 XDREAD (32) command
This << data and includes protection information as >> should be << data and
protection information, if any, as >>

IBM #84
PDF Page 94
5.44 XDWRITE (10) command
This << data and includes protection information as >> should be << data and
protection information, if any, as >>

IBM #85
PDF Page 95
5.45 XDWRITE (32) command
This << data and includes protection information as >> should be << data and
protection information, if any, as >>

IBM #86
PDF Page 96
5.46 XDWRITEREAD (10) command
This << data and includes protection information as >> should be << data and
protection information, if any, as >>

IBM #87
PDF Page 97
5.47 XDWRITEREAD (32) command
This << data and includes protection information as >> should be << data and
protection information, if any, as >>

IBM #88
PDF Page 98
5.48 XPWRITE (10) command
This << data and includes protection information as >> should be << data and
protection information, if any, as >>

IBM #89
PDF Page 100
5.49 XPWRITE (32) command
This << data and includes protection information as >> should be << data and
protection information, if any, as >>

IBM #90
PDF Page 101
6.1.2 Translate Address Output diagnostic page
This << command (see 5.4.2.4) - a short block format address, a long block
format address, a physical sector format
address, or a bytes from index format address - into any >> should be <<
command (see 5.4.2.4) (i.e., a short block
format address, a long block format address, a physical sector format
address, or a bytes from index format address)
into any >>

IBM #91
PDF Page 102
6.1.3 Translate Address Input diagnostic page
This << vendor reserved area, etc.). >> should be << vendor reserved area).
>>

IBM #92
PDF Page 104
6.2.2 Format Status log page
This << the most recent successful FORMAT UNIT command >> should be << the last successful FORMAT UNIT
command >>

IBM #93
PDF Page 105
6.2.2 Format Status log page
This << the most recent FORMAT UNIT command >> should be << the last FORMAT UNIT command >>

IBM #94
PDF Page 105
6.2.2 Format Status log page
This << the most recently successful FORMAT UNIT command >> should be << the last successful FORMAT UNIT
command >>

IBM #95
PDF Page 105
6.2.2 Format Status log page
This << the most recently successful FORMAT UNIT command >> should be << the last successful FORMAT UNIT
command >>
6.2.3 Non-volatile Cache log page
Table 98
This << Non-volatile cache is volatile (either permanently or temporarily, e.g., if batteries need to be recharged). >>
should be << Non-volatile cache is either permanently or temporarily volatile (e.g., if batteries need to be recharged).
>>

IBM #97
PDF Page 109
6.3.2.1 Mode parameter block descriptors overview
This << If it returns a mode >> should be << If the device server returns a mode >>

IBM #98
PDF Page 109
6.3.2.1 Mode parameter block descriptors overview
This << If it returns a mode >> should be << If the device server returns a mode >>

IBM #99
PDF Page 109
6.3.2.1 Mode parameter block descriptors overview
This << If it returns a mode >> should be << If the device server returns a mode >>

IBM #100
PDF Page 109
6.3.2.1 Mode parameter block descriptors overview
This << If it returns a mode >> should be << If the device server returns a mode >>

IBM #101
PDF Page 110
6.3.2.3 Long LBA mode parameter block descriptor
This << the MODE SELECT (10) and MODE SENSE (10) commands when >> should be << the MODE SELECT (10)
command and MODE SENSE (10) command when >>

IBM #102
PDF Page 112
6.3.3 Caching mode page
This << use the NUMBER OF CACHE SEGMENTS field or the CACHE SEGMENT SIZE field, dependent upon the

SIZE bit, to control the caching algorithm >> should be << use the NUMBER OF CACHE SEGMENTS field if SIZE is
set to zero or the CACHE SEGMENT SIZE field if SIZE is set to one to control the caching algorithm >>

IBM #103
PDF Page 112
6.3.3 Caching mode page
This << upon Caching mode page bytes 4 through 11 and is operation and/or vendor-specific. >> makes no sense.
Change to << upon Caching mode page bytes 4 through 11. >>

IBM #104
PDF Page 112
6.3.3 Caching mode page
This << A CAP bit set to zero specifies that caching analysis be disabled to reduce overhead time or to prevent
nonpertinent operations from impacting tuning values. >> should be << A CAP bit set to zero specifies that caching
analysis be disabled. >>

IBM #105
PDF Page 113
6.3.3 Caching mode page
Table 106 u Demand read retention priority and write retention priority
This table combines the description of the DEMAND RETENTION PRIORITY field and the WRTIE RETENTION
PRIORITY field into one table. This is very confusing. Make two tables, one for each field.

IBM #106
PDF Page 113
6.3.3 Caching mode page
table 106
This << WRITE or WRITE AND VERIFY command >> should be << WRITE command or WRITE AND VERIFY
command >>

IBM #107
PDF Page 113
6.3.3 Caching mode page
table 106
This << WRITE or WRITE AND VERIFY command >> should be << WRITE command or WRITE AND VERIFY
command >>
6.3.3 Caching mode page
This << The MINIMUM PRE-FETCH field specifies either a number of blocks or a scalar multiplier of the TRANSFER
LENGTH, depending upon the setting of the MF bit. >> should be << The MINIMUM PRE-FETCH field specifies a
number of blocks if the MF bit set set to zero or a scalar multiplier of the TRANSFER LENGTH if the MF bit is set to
one.>>

IBM #109
PDF Page 114
6.3.3 Caching mode page
This << according to the rules for reporting deferred errors. >> needs a reference as to were the rules are defined.

IBM #110
PDF Page 114
6.3.3 Caching mode page
This << The MAXIMUM PRE-FETCH field specifies either a number of blocks or a scalar multiplier of the TRANSFER
LENGTH, depending upon the setting of the MF bit. >> should be << The MINIMUM PRE-FETCH field specifies a
number of blocks if the MF bit set set to zero or a scalar multiplier of the TRANSFER LENGTH if the MF bit is set to
one.>>

IBM #111
PDF Page 114
6.3.3 Caching mode page
This << reorder the sequence of writing addressed logical blocks in order to achieve a faster command completion.
>> should be << reorder the sequence of writing addressed logical blocks. >>

IBM #112
PDF Page 114
6.3.3 Caching mode page
This << perform the SCSI buffer
function. >> needs a reference as to were the SCSI buffer function is defined.

IBM #113
PDF Page 115
6.3.4 Read-Write Error Recovery mode page
This << medium (e.g., READ, WRITE, WRITE AND VERIFY, etc.). >> should be << medium (e.g., READ commands,
WRITE commands , WRITE AND VERIFY commands). >>

IBM #114
PDF Page 115
6.3.4 Read-Write Error Recovery mode page
This << bits (EER, PER, DTE, and DCR) >> should be << bits (i.e., EER, PER, DTE, and DCR) >>

IBM #115
PDF Page 115
6.3.4 Read-Write Error Recovery mode page
This << bits (TB, EER, PER, DTE, and DCR) >> should be << bits (i.e., TB, EER, PER, DTE, and DCR) >>

IBM #116
PDF Page 116
6.3.4 Read-Write Error Recovery mode page
note 25
This << This bit may be used in image processing, audio, or video applications. >> should be << The TB (?) bit may
be used in image processing, audio, or video applications. >>

IBM #117
PDF Page 116
6.3.4 Read-Write Error Recovery mode page
This << bits (EER, DCR, DTE, and PER) within >> should be << bits (i.e., EER, DCR, DTE, and PER) within >>

IBM #118
PDF Page 116
6.3.4 Read-Write Error Recovery mode page
This << definitions for EER, PER, DTE and DCR are contained >> should be << definitions for the EER bit, PER bit,
DTE bit and DCR bit are contained >>

IBM #119
PDF Page 117
6.3.4 Read-Write Error Recovery mode page
Table 109 the 0 0 0 0 row
This description needs to be rewritten. I suggest it be changed to:
<< Error correction and the full number of retries as specified in the READ RETRY COUNT field, WRITE RETRY
COUNT field or VERIFY RETRY COUNT field (see 6.3.5) shall be attempted to recover the data. A CHECK
CONDITION is not reported at the completion of the command for recovered errors. The command terminates with
CHECK CONDITION status before the transfer count is exhausted only if an unrecoverable error is detected. If an
unrecoverable data error occurred on a read operation, the data in the block with the unrecoverable error shall only
be transferred if the TB bit is set to one. >>

IBM #120
PDF Page 117
6.3.4 Read-Write Error Recovery mode page
Table 109 the 0 0 0 1 row
This description needs to be rewritten. I suggest it be changed to:
<<No error correction shall be attempted however the full number of retries as specified in the READ RETRY COUNT
field, WRITE RETRY COUNT field or VERIFY RETRY COUNT field (see 6.3.5) shall be attempted to recover the data. A CHECK CONDITION is not reported at the completion of the command for recovered errors. The command
terminates with CHECK CONDITION status before the transfer count is exhausted only if an unrecoverable error is
detected. If an unrecoverable data error occurred on a read operation, the data in the block with the unrecoverable
error shall only be transferred if the TB bit is set to one. >>

IBM #121
PDF Page 117
6.3.4 Read-Write Error Recovery mode page
Table 109 the 0 1 0 0 row
This description needs to be rewritten. I suggest it be changed to:
<< Error correction and the full number of retries as specified in the READ RETRY COUNT field, WRITE RETRY
COUNT field or VERIFY RETRY COUNT field (see 6.3.5) shall be attempted to recover the data. The command
terminates with CHECK CONDITION status before the transfer count is exhausted only if an unrecoverable error is
detected. If an unrecoverable data error occurred on a read operation, the data in the block with the unrecoverable
error shall only be transferred if the TB bit is set to one. A CHECK CONDITION with a sense key of RECOVERED
ERROR is reported at the completion of the command for any recoverable error that occurs. The INFORMATION field
in the sense data shall contain the LBA of the last recovered error that occurred during the transfer.>>

IBM #122
PDF Page 117
6.3.4 Read-Write Error Recovery mode page
Table 109 the 0 1 0 1 row
This description needs to be rewritten. I suggest it be changed to:
<<No error correction shall be attempted however the full number of retries as specified in the READ RETRY COUNT
field, WRITE RETRY COUNT field or VERIFY RETRY COUNT field (see 6.3.5) shall be attempted to recover the
data. The command terminates with CHECK CONDITION status before the transfer count is exhausted only if an
unrecoverable error is detected. If an unrecoverable data error occurred on a read operation, the data in the block
with the unrecoverable error shall only be transferred if the TB bit is set to one. A CHECK CONDITION with a sense
key of RECOVERED ERROR is reported at the completion of the command for any recoverable error that occurs.
The INFORMATION field in the sense data shall contain the LBA of the last recovered error that occurred during the
transfer>>

IBM #123
PDF Page 118
6.3.4 Read-Write Error Recovery mode page
Table 109 the 0 1 1 0 row
This description needs to be rewritten. I suggest it be changed to:
<< Error correction and the full number of retries as specified in the READ RETRY COUNT field, WRITE RETRY
COUNT field or VERIFY RETRY COUNT field (see 6.3.5) shall be attempted to recover the data. The command
terminates with CHECK CONDITION status before the transfer count is exhausted if any recoverable or
unrecoverable error is detected. The INFORMATION field in the sense data shall contain the LBA of the block in
error. If an unrecoverable data error occurred on a read operation, the data

in the block with the unrecoverable error
shall only be transferred if the TB bit is set to one.>>

IBM #124
PDF Page 118
6.3.4 Read-Write Error Recovery mode page
Table 109 the 0 1 1 1 row
This description needs to be rewritten. I suggest it be changed to:
<<No error correction shall be attempted however the full number of retries
as specified in the READ RETRY COUNT
field, WRITE RETRY COUNT field or VERIFY RETRY COUNT field (see 6.3.5) shall
be attempted to recover the
data. The command terminates with CHECK CONDITION status before the transfer
count is exhausted if any
recoverable or unrecoverable error is detected. The INFORMATION field in the
sense data shall contain the LBA of
the block in error. If an unrecoverable data error occurred on a read
operation, the data in the block with the
unrecoverable error shall only be transferred if the TB bit is set to one.>>

IBM #125
PDF Page 118
6.3.4 Read-Write Error Recovery mode page
Table 109 the 1 0 0 0 row
This description needs to be rewritten. I suggest it be changed to:
<< Error correction and the fewest possible number of retries shall be
attempted to recover the data. A CHECK
CONDITION is not reported at the completion of the command for recovered
errors. The command terminates with
CHECK CONDITION status before the transfer count is exhausted only if an
unrecoverable error is detected. If an
unrecoverable data error occurred on a read operation, the data in the block
with the unrecoverable error shall only
be transferred if the TB bit is set to one. >>

IBM #126
PDF Page 118
6.3.4 Read-Write Error Recovery mode page
Table 109 the 1 1 0 0 row
This description needs to be rewritten. I suggest it be changed to:
<< Error correction and the fewest possible number of retries shall be
attempted to recover the data. The command
terminates with CHECK CONDITION status before the transfer count is
exhausted only if an unrecoverable error is
detected. If an unrecoverable data error occurred on a read operation, the
data in the block with the unrecoverable
error shall only be transferred if the TB bit is set to one. A CHECK
CONDITION with a sense key of RECOVERED
ERROR is reported at the completion of the command for any recoverable error
that occurs. The INFORMATION field
in the sense data shall contain the LBA of the last recovered error that
occurred during the transfer. >>

IBM #127
PDF Page 118
6.3.4 Read-Write Error Recovery mode page
Table 109 the 1 1 1 0 row
This description needs to be rewritten. I suggest it be changed to:
<< Error correction and the fewest possible number of retries shall be
attempted to recover the data. The command
terminates with CHECK CONDITION status before the transfer count is
exhausted if any recoverable or
unrecoverable error is detected. The INFORMATION field in the sense data
shall contain the LBA of the block in
error. If an unrecoverable data error occurred on a read operation, the data
in the block with the unrecoverable error
shall only be transferred if the TB bit is set to one. >>

IBM #128
PDF Page 119
6.3.4 Read-Write Error Recovery mode page

This paragraph combines two fields into one description which makes it
unclear as to what the field or fields are that
are being defined. It needs to be make into two paragraphs such as:
<< The READ RETRY COUNT field specifies the number of times that the device
server shall attempt its recovery
algorithm during a read operation. If the READ RETRY COUNT field and the
RECOVERY TIME LIMIT field are both
specified in a MODE SELECT command, the field that requires the least time
for data error recovery actions shall have priority.
The WRITE RETRY COUNT fields specifies the number of times that the device
server shall attempt its recovery
algorithm during a write operation. If the WRITE RETRY COUNT field and the
RECOVERY TIME LIMIT field are both
specified in a MODE SELECT command, the field that requires the least time
for data error recovery actions shall
have priority. >>

IBM #129
PDF Page 119
6.3.5 Verify Error Recovery mode page
This << The EER, PER, DTE, and DCR bits are defined in 6.3.4. >> should be
<< The EER bit, PER bit, DTE bit, and
DCR bit are defined in 6.3.4. >>

IBM #130
PDF Page 119
6.3.5 Verify Error Recovery mode page
Note 27
This << set the EER bit to zero, the PER, DTE, and DCR bits to one and the
number of retries and recovery time limit
to zero. >> should be << set the EER bit to zero, the PER bit to one, the
DTE bit to one, and DCR bit to one and the
number of retries to zero and recovery time limit to zero. >>

IBM #131
PDF Page 120
6.3.6 XOR Control mode page
This << within a device. >> should be << within the logical unit. >>

IBM #132
PDF Page 120
6.3.6 XOR Control mode page
This << parameters of the target. >> should be << parameters of the logical
unit. >>

IBM #133
PDF Page 120
6.3.6 XOR Control mode page
This << within a device. >> should be << within the logical unit. >>

IBM #134
PDF Page 120
6.3.6 XOR Control mode page
This << the target accepts >> should be << the device server accepts >>

IBM #135
PDF Page 121
6.4.2 Block Limits VPD page
This << a single PRE-FETCH, READ, VERIFY, WRITE, WRITE AND VERIFY, XDREAD,
XDWRITE,
XDWRITEREAD, or XPWRITE command. >> should be << a single PRE-FETCH command,
READ command,
VERIFY command, WRITE command, WRITE AND VERIFY command, XDREAD command,
XDWRITE command,
XDWRITEREAD command, or XPWRITE command. >>

IBM #136
PDF Page 121
6.4.2 Block Limits VPD page
This << a single PRE-FETCH, READ, VERIFY, WRITE, WRITE AND VERIFY, XDREAD,
XDWRITE,

XDWRITEREAD, or XPWRITE command. >> should be << a single PRE-FETCH command,
READ command,
VERIFY command, WRITE command, WRITE AND VERIFY command, XDREAD command,
XDWRITE command,
XDWRITEREAD command, or XPWRITE command. >>

IBM #137
PDF Page 121
6.4.2 Block Limits VPD page
This << a single PRE-FETCH, READ, VERIFY, WRITE, WRITE AND VERIFY, XDREAD,
XDWRITE,
XDWRITEREAD, or XPWRITE command. >> should be << a single PRE-FETCH command,
READ command,
VERIFY command, WRITE command, WRITE AND VERIFY command, XDREAD command,
XDWRITE command,
XDWRITEREAD command, or XPWRITE command. >>

IBM #138
PDF Page 122
A.2 Update write operation
This << Figure A.1 illustrates a read-modify-write >> should be << Figure
A.1 shows
a read-modify-write >>

IBM #139
PDF Page 122
A.2 Update write operation
This << a data disk device (holding protected user data), and a parity disk
device (holding check data) >> should be
<< a data disk device that holds protected user data, and a parity disk
device that holds check data >>

IBM #140
PDF Page 122
A.2 Update write operation
This << XDWRITE, XDREAD, and XPWRITE. XDWRITEREAD may be used in place of
any sequence of XDWRITE
followed by XDREAD. >> should be << XDWRITE command, XDREAD command, and
XPWRITE command.
XDWRITEREAD command may be used in place of any sequence of an XDWRITE
command
followed by an XDREAD command. >>

IBM #141
PDF Page 122
A.2 Update write operation
This << disk device (the supervising storage array controller does not yet
have the intermediate XOR data for this
command; the purpose of issuing the XPWRITE command at this time is to cause
the parity disk device to begin
reading XOR data from its medium to its buffer memory). >> should be << disk
device (i.e., the supervising storage
array controller does not yet have the intermediate XOR data for this
command. The purpose of issuing the XPWRITE
command at this time is to cause the parity disk device to begin reading XOR
data from its medium to its buffer
memory). >>

IBM #142
PDF Page 122
A.2 Update write operation
This << XOR data (read with the XDREAD command) available >> should be <<
XOR data (i.e., read with the
XDREAD command) available >>

IBM #143
PDF Page 123
A.3 Regenerate operation
This << Figure A.2 illustrates a regenerate >> should be << Figure A.2 shows
a regenerate >>

IBM #144
PDF Page 123
A.3 Regenerate operation
This << used: READ, XDWRITE, and XDREAD. XDWRITEREAD may be used in place of any sequence of
XDWRITE followed by XDREAD. >> should be << used: READ command, XDWRITE command, and XDREAD
command. XDWRITEREAD command may be used in place of any sequence of an XDWRITE command followed by
an XDREAD command. >>

IBM #145
PDF Page 123
A.2 Update write operation
Figure A.1
This << XDWRITE >> should be << XDWRITE command >>

IBM #146
PDF Page 123
A.2 Update write operation
Figure A.1
This << XDREAD >> should be << XDREAD command>>

IBM #147
PDF Page 123
A.2 Update write operation
Figure A.1
This << XPWRITE >> should be << XPWRITE command>>

IBM #148
PDF Page 124
A.3 Regenerate operation
Figure A.2
This << READ >> should be << READ command >>.

IBM #149
PDF Page 124
A.3 Regenerate operation
Figure A.2
This << XDWRITE or XDWRITEREAD >> should be << XDWRITE command or XDWRITEREAD command>>

IBM #150
PDF Page 124
A.3 Regenerate operation
Figure A.2
This << XDREAD or XDWRITEREAD >> should be << XDREAD command or XDWRITEREAD command>>

IBM #151
PDF Page 124
A.3 Regenerate operation
Figure A.2
This << XDWRITE or XDWRITEREAD >> should be << XDWRITE command or XDWRITEREAD command>>

IBM #152
PDF Page 124
A.3 Regenerate operation
Figure A.2
This << XDREAD or XDWRITEREAD >> should be << XDREAD command or XDWRITEREAD command>>

IBM #153
PDF Page 124
A.4 Rebuild operation
This << Figure A.3 illustrates a rebuild >> should be << Figure A.3 shows a rebuild >>

IBM #154
PDF Page 124

A.4 Rebuild operation
This << used: READ, XDWRITE, XDREAD, and WRITE. XDWRITEREAD may be used in place of any sequence of
XDWRITE followed by XDREAD. >> should be << used: READ command, XDWRITE command, XDREAD command, and WRITE command. XDWRITEREAD command may be used in place of any sequence of an XDWRITE command
followed by an XDREAD command. >>

IBM #155
PDF Page 125
A.4 Rebuild operation
This << is the "rebuilt" data and is sent >> should be << is the rebuilt data and is sent >>

IBM #156
PDF Page 125
A.4 Rebuild operation
Figure A.3
This << READ >> should be << READ command >>.

IBM #157
PDF Page 125
A.4 Rebuild operation
Figure A.3
This << XDWRITE or XDWRITEREAD >> should be << XDWRITE command or XDWRITEREAD command>>

IBM #158
PDF Page 125
A.4 Rebuild operation
Figure A.3
This << XDREAD or XDWRITEREAD >> should be << XDREAD command or XDWRITEREAD command>>

IBM #159
PDF Page 125
A.4 Rebuild operation
Figure A.3
This << WRITE >> should be << WRITE command >>.

****

Comments attached to Abs ballot from David Hawks of
Iomega Corp.:

Iomega has not chosen to carefully review SBC-2. Instead, Iomega believes SBC-3 should obsolete the Removable Media portion of SBC.

Actual massively distributed boot BIOS and operating systems have never fully supported Removable SBC as specified by t10.org. Consequently, designs for broad compatibility in read, boot, and write are moving to removable MMC UDF for more than 32 GiB/disc, as in the example of the Iomega REV drive, else to detachable but not removable SBC, as in the example of USB adapters for small Compact Flash.

****

Comments attached to Yes ballot from John Lohmeyer of
LSI Logic Corp.:

LSI #1
PDF Page vi
Pages vi -- x
Remove revision information from copy that goes to public review.

LSI #2
PDF Page 2
1 Scope
In item l) of the last list in this subclause, "this" s/b "the".

LSI #3
PDF Page 5
3.1.6 check data
"allows" s/b "may allow"

LSI #4
PDF Page 6
3.1.26 media:
Either remove this definition or add a definition of medium.

LSI #5
PDF Page 6
3.1.27 non-volatile cache memory:
It is probably better to define non-volatile separately from cache memory (and medium). We would then have separate definitions for non-volatile, volatile, cache memory, and medum.

LSI #6
PDF Page 7
3.2 Symbols and abbreviations
Please add:
CRC cyclic redundancy check

LSI #7
PDF Page 12
4.5 Ready state
In the last paragraph, replace "set to" with "set to one to".

LSI #8
PDF Page 12
4.8 Medium defects
First paragraph: Some block devices provide the application client control (of what?) through use of the mode parameters.

LSI #9
PDF Page 13
4.8 Medium defects
In list item d), replace "theprevious" with "the previous".

LSI #10
PDF Page 13
4.9 Cache memory
In the fourth paragraph, last sentence, consider adding "without power" to the end of the sentence, "There may be a limit on the amount of time a non-volatile cache is able to retain data."

LSI #11
PDF Page 13
4.9 Cache memory
Fifth paragraph, first sentence. Change "is written" to "is to be written".

LSI #12
PDF Page 14
4.9 Cache memory
Seventh paragraph, last sentence. Delete "specifies". Alternatively, re-word this sentence as follows: "An FUA_NV bit of one permits the device server to access a non-volatile cache memory rather than the medium."

LSI #13
PDF Page 14
4.9 Cache memory
Ninth paragraph, first sentence should read, "When a VERIFY command or a WRITE AND VERIFY command is processed,..."

LSI #14
PDF Page 33
5.1 Commands for direct-access block devices
Table 9, Note e
Change 'of'' to 'if'.

LSI #15
PDF Page 36
5.4.1 FORMAT UNIT command overview
Note 7 ahould be deleted. The information is already covered in the paragraph above table 13.

LSI #16
PDF Page 65
5.21 START STOP UNIT command
third paragraph from the end of this subclause
Replace this paragraph with "It is not an error to specify that the logical unit transition to its current power condition."

****

Comments attached to No ballot from Mark Evans of Maxtor Corp.:

Maxtor #1
PDF Page 1
Change the text in item (a) to, "Permit an application client to communicate over a SCSI service delivery subsystem with a logical unit that declares itself to be a direct-access device, write-once device, or optical memory device in the device type field of the INQUIRY command response data;"

Maxtor #2
PDF Page 1
Change "devices" to "device".

Maxtor #3
PDF Page 5
Add, "The set of contiguous logical blocks may be all of logical blocks on the device."

Maxtor #4
PDF Page 7
This definition is not clear. I don't understand it well enough to offer a recommendation.

Maxtor #5
PDF Page 10
Should "write" be changed to "data-out"? One way or the other, we should have a definition or at least be consistent.

Maxtor #6
PDF Page 10
Should "read" be changed to "data-in"? One way or the other, we should have a definition or at least be consistent.

Maxtor #7
PDF Page 10
Change to, "A block device containing a removable medium may require receipt of a START STOP UNIT command to become accessible for data-out or data-in operations."

Maxtor #8
PDF Page 11
Change "need" to "may".

Maxtor #9
PDF Page 13
Change to, "Cache memory is an area of temporary storage with fast access time that is implemented in most block devices to enhance performance. Cache memory exists separately from the user data stored on the medium and is not uniquely accessible by the application client. Use of cache memory for data-out or data-in operations may reduce the access time to a logical block and can increase the overall data throughput."

Maxtor #10
PDF Page 13
Change to, "During data-in operations, the block devices use..."

Maxtor #11
PDF Page 13
Change to, "During data-out operations, block devices use..."

Maxtor #12
PDF Page 13
Change to, "...to be written..."

Maxtor #13
PDF Page 13
I think this is supposed to be something like, "When the cache memory is filled with blocks of data that are being stored for possible future access, new blocks of data that are to be stored replace those currently in cache memory. The disable page out (DPO) bit allows the application client to influence the replacement of logical blocks in the cache. For data-out operations, setting this bit to one advises the device server to not replace existing blocks in the cache memory with the new data-out data. For data-in operations, setting the DPO bit to one advises the device server to not replace existing blocks in the cache memory with the new data-in data."

Maxtor #14
PDF Page 13
Change to, "...READ and WRITE..."

Maxtor #15
PDF Page 14
Delete, "effectively".

Maxtor #16
PDF Page 18
Delete, "traditionally".

Maxtor #17
PDF Page 18
Delete, "virtually".

Maxtor #18
PDF Page 20
This is a huge paragraph that is not clear to me. I recommend making this be more paragraphs something like: A stripe is a set of corresponding strips of consecutively addressed storage from two or more block devices. A strip is an equal division of the storage capacity in a set of consecutively addressed LBAs on a single block device. When the storage array controller issues an update write to a device, the data in the device has been updated when successful status is returned for the command. Until the device containing check data has been updated, however, the associated stripe in the redundancy group is not consistent (e.g., performing an XOR operation on the protected data does not produce the check data). The storage array controller shall keep track of this window of inconsistency and make sure that a regenerate or rebuild operation for any data extent within the stripe is not attempted until after the device containing check data has been updated (making the stripe consistent again). For multi-initiator systems, tracking the updates may be more complex because each storage array controller needs to ensure that a second storage array controller is not writing to a stripe that the first storage array controller is regenerating or rebuilding. The coordination between storage array controllers is system specific and is beyond the scope of this standard. A storage array controller needs to prevent data corruption due to a temporarily inconsistent stripe in one case. When an XDWRITE or XDWRITEREAD command has been issued and completed, the device containing protected data has been updated but the device containing check data has not. The stripe is inconsistent until the XPWRITE command to the device containing check data returns completion status.

Maxtor #19

PDF Page 21
Delete "directly" unless there are other errors to be defined that
result "indirectly" from the primary command.

Maxtor #20
PDF Page 29
Delete, "primarily".

Maxtor #21
PDF Page 29
Delete, "primarily".

Maxtor #22
PDF Page 30
Change to "O".

Maxtor #23
PDF Page 31
Change to "O".

Maxtor #24
PDF Page 33
Delete note.

Maxtor #25
PDF Page 45
Delete, "actually"

Maxtor #26
PDF Page 48
Delete, "directly".

Maxtor #27
PDF Page 66
Change to, "The synchronize cache function is also performed by the
device server as the result of other commands defined in other clauses
of this standard (e.g., when the FUA bit is set to one for a write
command, contiguous cached data may be written to the media)."

Maxtor #28
PDF Page 115
Change to, "(e.g., READ, WRITE, and WRITE AND VERIFY).

Maxtor #29
PDF Page 115
Change to, "The device server shall report any failures that occur
during the reallocation operation. Error reporting as specifed by the
error recovery bits (EER, PER, DTE, and DCR) shall be performed only
after completion of the reallocation."

Maxtor #30
PDF Page 115
Change to, "The device server shall report any failures that occur
during the reallocation operation. Error reporting as specifed by the
error recovery bits shall be performed only after completion of the
reallocation."

Maxtor #31
PDF Page 115
Add, "The data returned in this case is vendor specific."

Maxtor #32
PDF Page 116
There needs to be a tie-in to "fabricated data". This note could be
deleted with the recommended insertion in the
previous paragraph.

Maxtor #33
PDF Page 116
Change to, "an".

Maxtor #34
PDF Page 120
Change to, "shall enable".

****

Late Comments from Jeff Mastro of
Microsoft Corp.:

MSFT #1
4.4 Logical blocks

Add notification of a change to block size / number of blocks
Modification of READ CAPACITY data (block size or number) shall result
in a unit attention condition with a sense code indicating such change.

****

Comments attached to Abs ballot from Jim Jones of
Quantum Corp.:

Not materially affected by this proposal.

****

Comments attached to No ballot from Gerald Houlder of
Seagate Technology:

Seagate #1
PDF Page 10
SPC-3, under table 237, has this statement:
"For a list of commands affected by the SWP bit and details of the WP
bit see the command standard (see 3.1.18) for the specific device type."
I would expect SBC-2 to have such a list in the model section, but it
doesn't even mention a write protected mode. We have SPC-3 making a
promise that SBC-2 is not keeping. A write protect section listing
affected commands should be added to the model.

Seagate #2
PDF Page 52
Change to:
This knowledge may be obtained by use of the READ (32) command (see
5.13) or by a method not defined by this standard.

Seagate #3
PDF Page 52
Change to:
This knowledge may be obtained by use of the READ (32) command (see
5.13) or by a method not defined by this standard.

Seagate #4
PDF Page 71
Change to:
This knowledge may be obtained by use of the VERIFY (32) command (see
5.27) or by a method not defined by this standard.

Seagate #5
PDF Page 71
Change to:
This knowledge may be obtained by use of the VERIFY (32) command (see
5.27) or by a method not defined by this standard.

Seagate #6
PDF Page 81
A note is needed:
If the RTO_EN bit is set to zero in the long read capacity data (see
5.15) and the device server checks the logical block reference tag, the
device server checks it with the lower 4 bytes of the LBA associated

with the logical block. If the RTO_EN bit is set to one and the device server checks the logical block reference tag, the device server checks the logical block reference tag only if it has knowledge of the contents of the LOGICAL BLOCK REFERENCE TAG field. This knowledge may be obtained by use of the Write (32) command (see 5.32) or by a method not defined by this standard.

Seagate #7
PDF Page 81
A note is needed:
If the RTO_EN bit is set to zero in the long read capacity data (see 5.15), the device server checks the logical block reference tag with the lower 4 bytes of the LBA associated with the logical block. If the RTO_EN bit is set to one, the device server checks the logical block reference tag only if it has knowledge of the contents of the LOGICAL BLOCK REFERENCE TAG field. This knowledge may be obtained by use of the Write (32) command (see 5.32) or by a method not defined by this standard.

Seagate #8
PDF Page 81
A note is needed:
If the RTO_EN bit is set to zero in the long read capacity data (see 5.15) and the device server checks the logical block reference tag, the device server checks it with the lower 4 bytes of the LBA associated with the logical block. If the RTO_EN bit is set to one and the device server checks the logical block reference tag, the device server checks the logical block reference tag only if it has knowledge of the contents of the LOGICAL BLOCK REFERENCE TAG field. This knowledge may be obtained by use of the Write (32) command (see 5.32) or by a method not defined by this standard.

Seagate #9
PDF Page 81
A note is needed:
If the RTO_EN bit is set to zero in the long read capacity data (see 5.15), the device server checks the logical block reference tag with the lower 4 bytes of the LBA associated with the logical block. If the RTO_EN bit is set to one, the device server checks the logical block reference tag only if it has knowledge of the contents of the LOGICAL BLOCK REFERENCE TAG field. This knowledge may be obtained by use of the Write (32) command (see 5.32) or by a method not defined by this standard.

****

Comments attached to Yes ballot from Vit Novak of
Sun Microsystems, Inc.:

Sun 1
page 10, 4.1, 3rd paragraph

The first 3 sentences of this paragraph are misleading. There is no provision in SBC or SPC for each block to have a unique block length. This should simply say something like, "The block length is constant for the entire LU."

Sun 2
page 12, 4.6, 1st paragraph, 3rd sentence.

Do any of the mode page parameters still allow setting of "geometry" since we obsoleted the format and geometry pages?

Sun 3
page 30, table 9, Inquiry row.

Protection information column should say 'yes'.

Sun 4
page 30, table 9, Read (6) row.

Protection information column needs a note. The Read (6) command has no protection information in the CDB nor the data, yet protection information may be a factor in the processing of the command by the device.

Sun 5
page 31, table 9, Read Capacity (16) row.

Protection information column should say 'yes'.

Sun 6
page 31, table 9, Synchronize Cache (10 & 16) rows.

Protection information columns should say 'no'.

Sun 7
page 32, table 9, Write (6) row.

Protection information column needs a note. The Write (6) command has no protection information in the CDB nor the data, yet protection information may be a factor in the processing of the command by the device.

Sun 8
p 45, 5.5, last paragraph.

Suggested rewording to deal with the "initiator port" vs. I_T nexus issue (see 04-088)

"Multiple locks may be in effect from initiator ports associated with more than one I_T nexus. Locks associated with different I_T nexus may overlap. An unlock of an overlapped area does not release the lock associated with another I_T nexus."

Sun 9
page 55, 5.13, 5th and 6th paragraphs.

"When checking of the LOGICAL BLOCK APPLICATION TAG is enabled" should also include "and the ATO bit is 1". If the App tag is owned by the device server these two fields in Read(32) should be ignored.

Sun 10
page 67, 5.24, first paragraph

"log read" s/b "long read"

Sun 11
page 81, table 68, row 1 (000b/Yes) notes g and h.

Is a Write(32) with wrprotect=000b allowed? If so, then notes g and h should be modified to allow the values from the Write(32) CDB to be used. If not, then we need to address this in the Write(32) text.

Sun 12
page 81, table 81, 001b/yes/app-tag

Why "Shall not" check? Seems to me is should be "May" with note c. But, it should also be qualified with whether or not ATO is set. If ATO, and Write(32) then the device should be checking....

If not ATO, then the device is generating or ignoring, but not checking.

Sun 13
Page 84, 5.32, paragraphs 5 & 6.

"When checking of the LOGICAL BLOCK APPLICATION TAG is enabled" needs to be qualified with the setting of ATO. If ATO is zero, these fields are ignored.

Sun 14

page 89, 5.39, 1st paragraph.

"WRPROTECT" should be followed with a reference back to table 68

Sun 15
page 109, 6,3.2.2, paragraphs 3 & 4.

The two paragraphs starting with "On a MODE SENSE command,...." confuse me. The previous paragraph states that the Number of Blocks field on a Mode Sense returns a certain value, yet these two paragraphs seem to contradict that. It would make more sense if these rules were on a Mode Select, but I'm still not sure I see the subtle difference - the last phrase of each paragraph is exactly the same. Same comment applies below to the Long LBA format also.

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Comments attached to Abs ballot from Ashlie Fan of
Tyco Electronics:

lack of expertise to comment

********** End of Ballot Report **********