

Overall comments on ballot:

1. The discussion presented in documents on the ATSC website leads us to conclude that the proposal does not appear to clearly meet the stated goals of robustness and there is inconclusive evidence that any reception improvement is gained.
2. We believe that the proposal is not needed with current 5th-generation silicon, and that the DTV transition is best served by concentration of effort on better parts for the existing 8-VSB or 16-VSB services.
3. Although we are encouraged to see many broadcasters who support the E-VSB proposal and are looking forwards, we are concerned that the added system complexities of the proposal have not been fully analyzed. In their June 21 rebuttal comments to CEA's letter, NAB says "E-VSB is not fundamentally different [than MPEG-2 multicasting]." In fact, it is. The SI and PSI tables required to signal a single MPEG-2 multicast stream are becoming well known in the terrestrial broadcast community, and have been managed for nearly a decade worldwide. The complexity of managing an E-VSB+VSB broadcast channel that consists of two linked pools of bandwidth is more than twice the complexity of managing a single MPEG-2 multicast system. If the proposal was intended to enhance robustness, and only included the MPEG-2 domain redundancy coding, much of the complexity could be "hidden" without the need for additional interleaving and changes to the broadcaster's procedures. We are unconvinced the goal of better reception under all conditions has been met (#1 above).
4. The balloted proposal appears to be deficient - no indication of required changes to the body of A/53, and editorial privilege to Annex D only. Based on the ballot, voters may infer that no changes (editorial or substantive) are required to any part of A/53 other than the one representing Annex D. At least one change is required in Annex C of A/53C (See correction 6. below) It is unclear whether other changes to A/53 are required. (In the event that the proposal passes and that this concern is a real problem with the process, this particular issue is probably best rectified by an immediate ballot on A/53 itself, prior to publication of A/53D.)

Comments on the proposal:

1. [editorial] Seems like a missing informative reference to SMPTE 310M, which is used in figure D5.2 and section 5.2. If the term "SMPTE 310 link" means "compressed MPEG bit stream link", perhaps SMPTE 310 should not be referenced.
2. [editorial/substantive] Missing reference to "Such methods are discussed in other ATSC standards" (how to carry map data and field sync timing). If no such standards exist, document should not imply that they do, and should mention "other expected ATSC or SMPTE standards".
- 3-4.
p.16 "For the purpose for maintaining strict backward compatibility for existing receivers, a 0x47 Sync byte and the 3 MPEG-2 header bytes of each Main packet carrying Enhanced encoded data are mapped into the null packet designated by 0x1FFF and prepended to each 184-byte enhanced segment."
(3) [editorial] The "designated by 0x1FFF" is either extraneous and misleading (all null packets have PID==0x1FFF), or describes some mechanism for designating a particular null packet that does not seem to be present in the standard. Suggest deletion (or parenthetical comment).
- (4) [substantive] What is described by this language is a process where 4 bytes are being mapped **into** an MPEG-2 null packet (presumably in the data_byte part of the packet

which may "contain any value"), and that null packet is being prepended to another 184-byte segment.

What is meant is probably instead "For the purpose for maintaining strict backward compatibility for existing receivers, the 0x47 Sync byte and the 3 MPEG-2 header bytes of each Main packet carrying Enhanced encoded data are mapped onto a null packet (designated by PID value 0x1FFF) which also contains the 184-byte enhanced segment." or, more clearly,

"For the purpose for maintaining strict backward compatibility for existing receivers, 188-byte Main packets that contain Enhanced encoded data are composed of a 0x47 Sync byte, the first 3 bytes that designate a null packet, and the 184-byte enhanced segment".

5. [substantive] Continuity for null PID packets is undefined by the MPEG-2 standard, but may incorrectly be perceived to be useful in this specific case. Language that reminds implementers how to treat the continuity bits should be included. Clarification should follow after the above, and would either restate "In the case of a null packet the value of the continuity counter is undefined." and/or would refer to 2.4.3.3 of reference [D1]

6. [editorial/substantive] The various changes required in the body of A/53 at Annex C 7.2 to resolve references to "Annex D" are not included. At the very least, this appears to include an editorial change to section 7.2.

7. [editorial] Figures D5.10, D5.11, D5.12, D5.13, "N/E [sic] Byte flag" should be "M/E Byte flag" (for Main/Enhanced) in all cases.

8. [substantive] 5.4.2.1.1.2:

Background: The proposal requires that each PCR shall be adjusted (at the MUX) to accommodate the actual MPEG-2 packet delivery time. The proposal also defines 2 independent (from an MPEG-2 layer) transports (8VSB and EVSB). Annex C of A/53C (at least) requires compliance with the MPEG-2 T-STD model. There are 3 classes of target decoders that one could design (8VSB only, EVSB only, combo), and services that either span or do not span the two possible transport streams. The concern is services that include streams from both transports, and combo receivers that are expected to interact with spanning services.

Concern: The proposed standard describes the broadcast stream, and does not define the receiver implementation. There are at least 2 obvious ways to build a receiver, and a choice of either precludes correct PCR adjustment (above) for the other. A receiver could manage the 2 independent streams (8VSB and EVSB) and only combine them at the MPEG decode stage (T-STD), or a receiver could demodulate both streams and recreate and manage the "compatible" complete transport stream shown in figure D5.10. The 2 designs differ in the delays they would introduce at the input (delivery) to a T-STD, and it is unclear how the PCR should be adjusted in the mux to compensate for "the actual MPEG-2 Transport Stream packet delivery time".

Suggested change: Either the proposal should describe that PCRs should be adjusted and made consistent between 8VSB and EVSB transports, and should define additional stream requirements for compliance with a particular input model to the T-STD, OR the language should define which transport stream(s) are delivered to what point in the T-STD, OR the language in the appropriate section or the proposal should mandate that services that span transports are not supported/disallowed.

9. [substantive] The third paragraph of section 5.6.1 mandates that the maximum bitrate in the E-VSB stream shall be 3 Mbps out of the total 19.4 Mbps at certain times. Definition of "during premium programming times" is not provided, and seems to be a

policy matter out of scope for the standard. Suggest that language should read instead "Additionally, during certain times of the day, the maximum bitrate..."