Questions

1. Managed vs Signaled
   1. The MC Insert Zones is signaled because it need not appear in each MC frame with the same MCID. This provides the means to allow low latency messages to be inserted into the frame.
   2. The VC Insert Zones is signaled because it need not appear in each VC frame with the same VCID. This provides the means to allow low latency messages to be inserted into the frame.
   3. The inclusion of Security is managed in a VC. If security is to be included at any time then there needs to be something in the frame that identifies the Security Association (SA) for the frame. The present rules included in the CCSDS Space Link Security specifications requires a Security Header that includes the Key reference. There are issues associated with this requirement:
      1. There is added overhead in each frame. The probability is that the only change in SA is the key because having multiple security algorithms implemented for a mission is impractical because it adds too much implementation and testing complexities./activities. Thus the VCID could identify the SA (exclusive of the key). The key will only change if commanded or automatically if the security counter overflows. Thus each key change is predictable. The use of a very large counter to provide replay protection could reduce of even eliminate an automatic key change.
      2. It is possible with the use of a very large VC Sequence Counter that there would not be a need to include a separate security counter.
   4. Should some of the proposed field sizes be reduced to enable the saved bits to be used for a different purpose that will be discussed later.
      1. Are 64 VCs required? The inclusion of VC Sub channels adds a significant number of data streams that can be multiplexed into a Master Channel. Note: If only 32 VC are required, then the extra bit is available to use as a signaling flag (Its use will be discussed later.)
      2. Are 213 SCIDs required? Will an enterprise of space vehicles ever require such a large number? Can a bit be saved by reducing the size of the SCID to 212 possible values and be more useful for a different purpose?
      3. Can the frame size be reduced to 15 bits? This is still an increase of 16 times the current maximum. If the size were to be reduced to 15 bits then the first bit in the pointer field could be used to identify the type of data included in the VC information Field. Then again is it necessary to identify the data type since it can easily be constrained by management of the VC or VC Sub channel.
   5. If a bit can be saved as suggested in d) above then how could it be used effectively?
      1. A flag field could be added to signal the presence of the FEC field. Since the size of the FEC has been different for DTE applications vs Proximity use, must the size of the FEC be identified and would that identify the algorithm in use? For example a 2 bit field would have 4 values: no FECF, a 16 bit FECF, a 24 bit FECF or a 32 bit FECF.
      2. Should the VC OCF field be signaled in the header? This could be managed within the VC construction rules but these rules may not be available to the MC processes. Should the MC processes provide the OCF service in order to minimize the latency in the OCF service? I personally would suspect that the OCF would be included in those VCs that have a real time delivery requirement and thus this would not be required.
      3. Should a bit be used to signal a sequence control Bypass as provided in TC or could the VCID provide that functionality?
   6. Should the size of the VC Sub channel counter be enlarged by reducing the contained data field type to 1 bit eliminating the spares or even eliminated totally as could result from d-iii above. The enlarging of the counter would increase the assurance of continuity.