SOURCE   : Japan
TITLE   : Some considerations on the coding segments
PURPOSE : Discussion
Relevant sub-group: Video

1.Introduction

The Video Conference System is regarded as a typical application of video coding. We can have a face-to-face conference, talking over each other, and also we can make an excellent presentation using VTR in the conference. Generally, in a video conference, we should employ the lowdelay coding with $M=1$ for real-time communication. Concerning the VTR presentation, however, we can use the $M=3$ coding to obtain higher coding efficiency. In this case, several coding segments with different M values are connected in series.

coded bit-stream

VTR presentation (M=3)	Conference (M=1)	

←coding segment→ | ←coding segment→

→ time
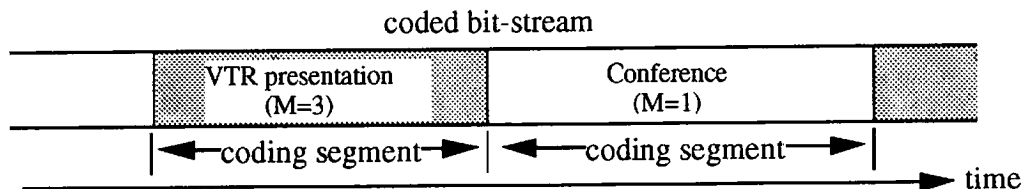
If an $M=1$ segment follows an $M=3$ segment or an $M=3$ segment follows an $M=1$ segment, encoding should be carefully performed not to cause VBV(or decoding) violation taking into account of some problems. This contribution points out these problems and shows some examples of encoding operations taking into account of the problems.

2.Encoding M=1 segment following M=3 segment

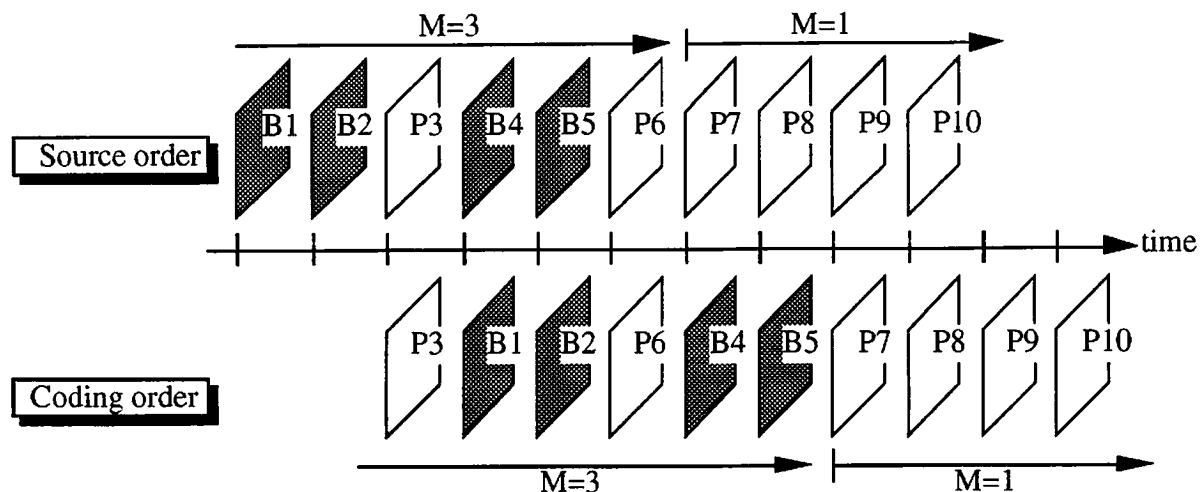The Fig.1 shows a series of pictures in the source order and coding order in this case.

Fig.1 M=1 segment following M=3 segment

It is noted that the M=3 segment gives coding delay due to picture reordering to the M=1 segment. To retrieve the lowdelay coding in M=1 segment, for example, the coding can be controlled as shown in Fig.2.
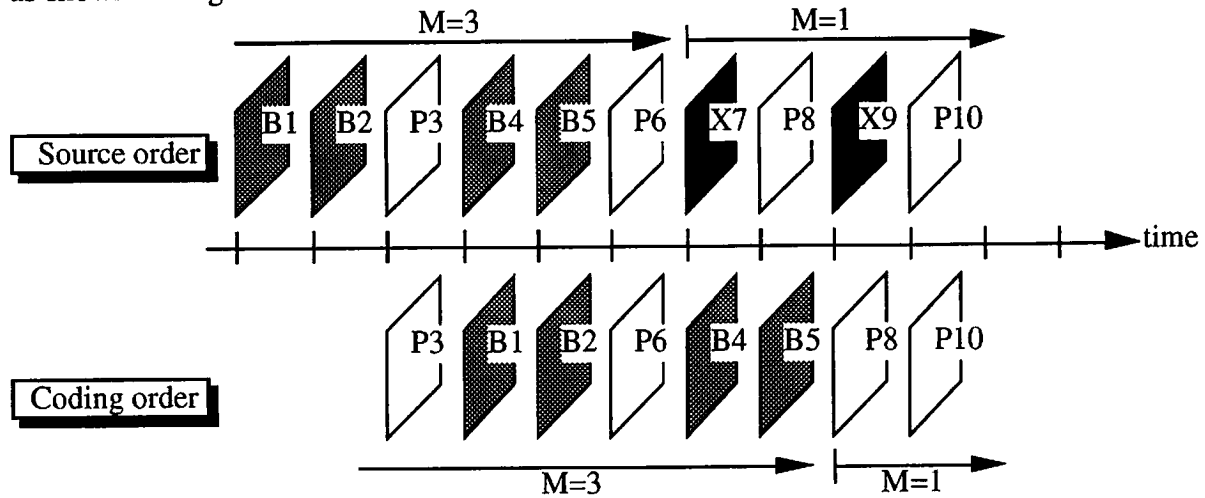
Fig.2 M=1 segment following M=3 segment

Thus if the encoder would omit to code X7 and X9, the lowdelay coding should be retrieved from the picture P10. It is clear that the encoder may drop other pictures to retrieve the lowdelay coding.

3.Encoding M=3 segment following M=1 segment

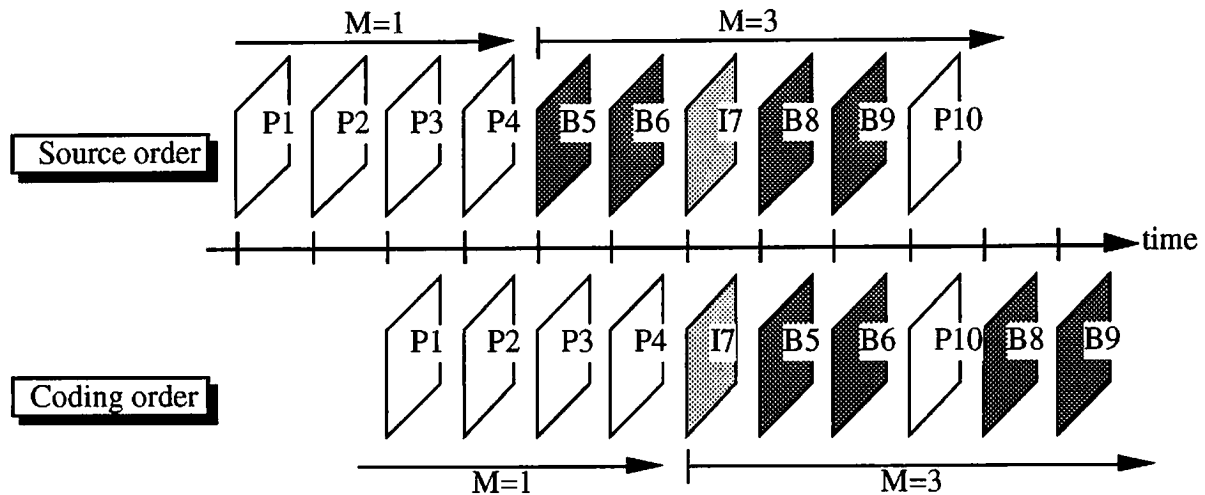The Fig.3 shows a series of pictures in the source order and coding order in this case.

Fig.3 M=3 segment following M=1 segment

If the lowdelay coding has been employed in the M=1 segment, the coding operation for subsequnt M=3 segment is performed as shown in Fig.4
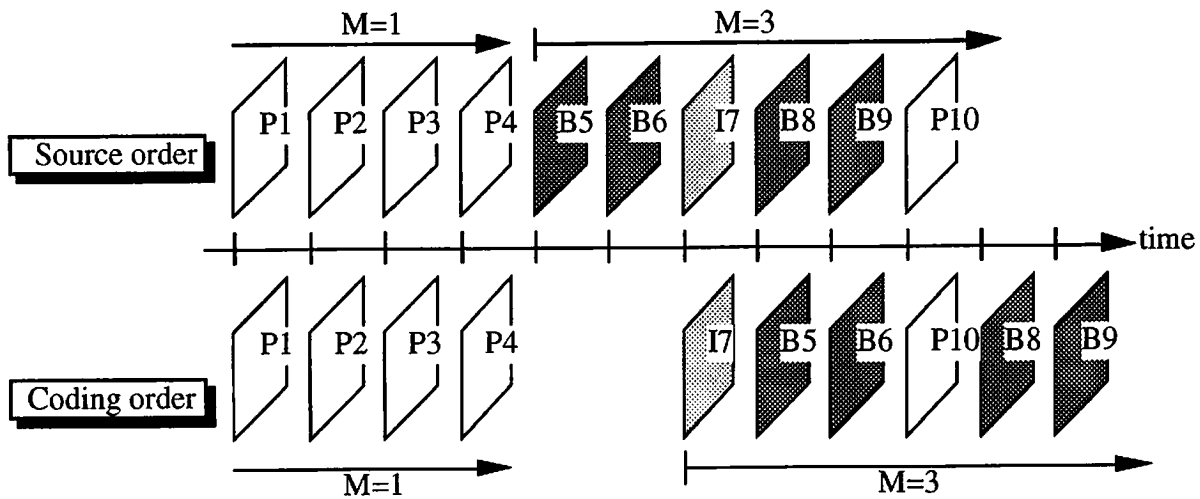
Fig.4 M=3 segment following M=1 segment

In this case, VBV behaves as if picture skipping has occured during P4-I7. Then the VBV buffer occupancy can be depicted as;
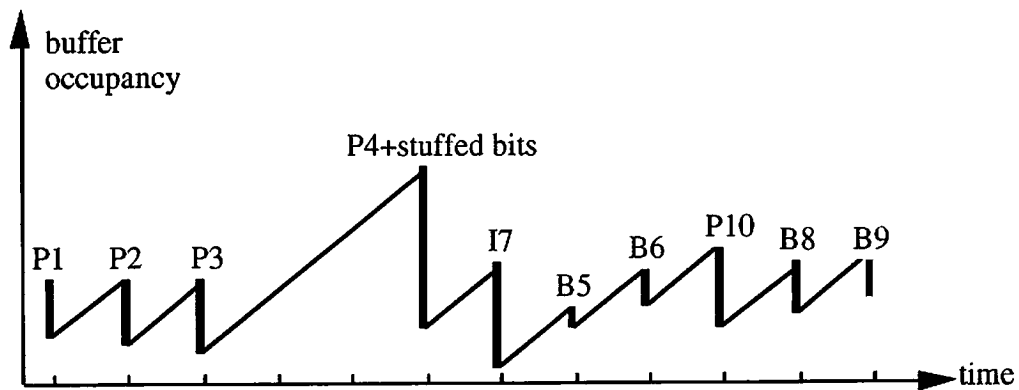

Fig.5 VBV buffer occupancy

Thus the encoding should be carefully performed not to cause VBV violation taking into account of this 'imaginary skipped pictures'.

END