CLAIMS

1. A method of video processing, comprising:

performing a conversion between a video having one or more video layers comprising one or more video pictures and a bitstream of the video according to a fourth rule,

wherein the fourth rule specifies that a trailing picture in the bitstream is permitted to be associated with a gradual decoding refresh picture;

wherein the trailing picture follows the gradual decoding refresh picture in a decoding order or an output order;

wherein the conversion is performed according to a second rule;

wherein the second rule specifies that when a current picture, with a network abstraction layer (NAL) unit header layer identifier equal to a particular value layerId, is a specific picture, there is no picture referred to by an entry in RefPicList[0] or RefPicList[1] that precedes, in the output order or the decoding order, any preceding intra random access point (IRAP) picture with a corresponding NAL unit header layer identifier equal to layerId in the decoding order;

wherein the conversion is performed according to a third rule;

wherein the third rule specifies that a first video picture that is an associated IRAP picture of a second picture and the second picture are constrained to belong to the same video layer;

wherein, between the first video picture and the second picture in the decoding order or the output order, there is no gradual decoding refresh picture in the same video layer; and

wherein the fourth rule further specifies that, for each layer, each picture of the layer, except a first picture in the layer in the bitstream, is specified to be associated with a closer one of a previous IRAP picture or at least one gradual decoder refresh picture of the same layer in the decoding order.

2. The method of claim 1, wherein the conversion is performed according to a first rule; and

wherein the first rule specifies to apply a first constraint on the decoding order of a current picture associated with an IRAP picture and a non-leading picture if and only if the current picture associated with the IRAP picture, the IRAP picture and the non-leading picture are in a same layer.

3. The method of claim 2, wherein the first constraint specifies that in a case that a value of a field sequence flag is equal to 0 and the current picture, associated with the IRAP picture, with an NAL unit header layer identifier equal to a particular value is a leading picture associated with the IRAP picture, the current picture associated with the IRAP picture precedes, in the decoding order, all non-leading pictures that are associated with the IRAP picture.

4. The method of claim 3, wherein if the value of the field sequence flag is equal to 1, let picA and picB be a first and a last leading pictures, in the decoding order, associated with an associated IRAP picture, respectively, there is at most one non-leading picture with a corresponding NAL unit header layer identifier equal to layerId preceding picA in the decoding order, and there is no non-leading picture with a corresponding NAL unit header layer identifier equal to layerId between picA and picB in the decoding order.

5. The method of claim 3, wherein the value of the field sequence flag that is equal to 0 indicates that a coded layer video sequence conveys pictures that represent frames.

6. The method of claim 1, wherein the specific picture is another IRAP picture or a clean random access picture.

7. The method of claim 1, wherein the first video picture and the second picture have a same identifier of a layer to which a video coding layer network abstraction layer unit belongs or a same identifier of a layer to which a non-video coding layer network abstraction layer unit applies.

8. The method of any one of claims 1-7, wherein the fourth rule further specifies that the trailing picture in the bitstream is permitted to be associated with an associated IRAP picture.

9. The method of claim 8, wherein the trailing picture is a picture for which each video coding layer network abstraction layer unit has a trail network abstraction layer unit type.

10. The method of claim 8, wherein the trailing picture follows the associated IRAP picture in the decoding order or the output order.

11. The method of claim 8, wherein pictures that follow the associated IRAP picture in the output order and precede the associated IRAP picture in the decoding order are not allowed.

12. The method of any one of claims 1-11, wherein the conversion is performed according to a fifth rule;

wherein the fifth rule specifies that a fifth constraint for the output order of pictures preceding an IRAP picture in the decoding order is applicable to pictures in a same video layer.

13. The method of claim 12, wherein the fifth constraint specifies that any picture having an NAL unit header layer identifier equal to a particular value and preceding, in the decoding order, an IRAP picture with the NAL unit header layer identifier equal to the particular value is required to precede, in the output order, the IRAP picture and all associated random access decodable leading pictures.

14. The method of any one of claims 1-13, wherein the conversion includes encoding the video into the bitstream.

15. The method of any one of claims 1-13, wherein the conversion includes decoding the video from the bitstream.

16. An apparatus for processing video data comprising a processor and a non-transitory memory with instructions thereon, wherein the instructions upon execution by the processor, cause the processor to:

perform a conversion between a video having one or more video layers comprising one or more video pictures and a bitstream of the video according to a fourth rule,

wherein the fourth rule specifies that a trailing picture in the bitstream is permitted to be associated with a gradual decoding refresh picture;

wherein the trailing picture follows the gradual decoding refresh picture in a decoding order or an output order;

wherein the conversion is performed according to a second rule;

wherein the second rule specifies that when a current picture, with a network abstraction layer (NAL) unit header layer identifier equal to a particular value layerId, is a specific picture, there is no picture referred to by an entry in RefPicList[0] or RefPicList[1] that precedes, in the output order or the decoding order, any preceding intra random access point (IRAP) picture with a corresponding NAL unit header layer identifier equal to layerId in the decoding order;

wherein the conversion is performed according to a third rule;

wherein the third rule specifies that a first video picture that is an associated IRAP picture of a second picture and the second picture are constrained to belong to the same video layer;

wherein, between the first video picture and the second picture in the decoding order or the output order, there is no gradual decoding refresh picture in the same video layer; and

wherein the fourth rule further specifies that, for each layer, each picture of the layer, except a first picture in the layer in the bitstream, is specified to be associated with a closer one of a previous IRAP picture or at least one gradual decoder refresh picture of the same layer in the decoding order.

17. A non-transitory computer-readable storage medium storing instructions that cause a processor to:

perform a conversion between a video having one or more video layers comprising one or more video pictures and a bitstream of the video according to a fourth rule,

wherein the fourth rule specifies that a trailing picture in the bitstream is permitted to be associated with a gradual decoding refresh picture;

wherein the trailing picture follows the gradual decoding refresh picture in a decoding order or an output order;

wherein the conversion is performed according to a second rule;

wherein the second rule specifies that when a current picture, with a network abstraction layer (NAL) unit header layer identifier equal to a particular value layerId, is a specific picture, there is no picture referred to by an entry in RefPicList[0] or RefPicList[1] that precedes, in

the output order or the decoding order, any preceding intra random access point (IRAP) picture with a corresponding NAL unit header layer identifier equal to layerId in the decoding order;

wherein the conversion is performed according to a third rule;

wherein the third rule specifies that a first video picture that is an associated IRAP picture of a second picture and the second picture are constrained to belong to the same video layer;

wherein, between the first video picture and the second picture in the decoding order or the output order, there is no gradual decoding refresh picture in the same video layer; and

wherein the fourth rule further specifies that, for each layer, each picture of the layer, except a first picture in the layer in the bitstream, is specified to be associated with a closer one of a previous IRAP picture or at least one gradual decoder refresh picture of the same layer in the decoding order.

18. A non-transitory computer-readable recording medium storing a bitstream of a video which is generated by a method performed by a video processing apparatus, wherein the method comprises:

generating the bitstream of the video having one or more video layers comprising one or more video pictures according to a fourth rule,

wherein the fourth rule specifies that a trailing picture in the bitstream is permitted to be associated with a gradual decoding refresh picture;

wherein the trailing picture follows the gradual decoding refresh picture in a decoding order or an output order;

wherein the generating is performed according to a second rule;

wherein the second rule specifies that when a current picture, with a network abstraction layer (NAL) unit header layer identifier equal to a particular value layerId, is a specific picture, there is no picture referred to by an entry in RefPicList[0] or RefPicList[1] that precedes, in the output order or the decoding order, any preceding intra random access point (IRAP) picture with a corresponding NAL unit header layer identifier equal to layerId in the decoding order;

wherein the generating is performed according to a third rule;

wherein the third rule specifies that a first video picture that is an associated IRAP picture of a second picture and the second picture are constrained to belong to the same video layer;

wherein, between the first video picture and the second picture in the decoding order or the output order, there is no gradual decoding refresh picture in the same video layer; and

wherein the fourth rule further specifies that, for each layer, each picture of the layer, except a first picture in the layer in the bitstream, is specified to be associated with a closer one of a previous IRAP picture or at least one gradual decoder refresh picture of the same layer in the decoding order.