CLAIMS

What is claimed is:

1. A method of decoding implemented by a video decoder, comprising:

receiving, by the video decoder, a video bitstream including a picture unit (PU), wherein a gradual decoding refresh (GDR) flag in a picture header (PH) of the PU has a first value to specify that a picture associated with the PH is a GDR picture; and

decoding, by the video decoder, the GDR picture from the PU to obtain a decoded picture.

2. The method of claim 1, wherein the first value is one.

3. The method of any of claims 1 to 2, wherein the GDR flag is designated as ph_gdr_pic_flag.

4. The method of any of claims 1 to 3, wherein the PH contains a picture order count (POC) identifying a recovery point picture corresponding to the GDR picture in the PU.

5. The method of any of claims 1 to 4, wherein the PH is contained within a PH network abstraction layer (NAL).

6. The method of any of claims 1 to 5, wherein the PH contains syntax elements that apply to all slices of the GDR picture.

7. The method of claim 6, wherein a slice of the GDR picture is contained in a video coding layer (VCL) NAL unit.

8. The method of claim 6, wherein the PH NAL unit immediately precedes a first video coding layer (VCL) NAL unit in the PU.

9. The method of any of claims 1 to 8, further comprising displaying the decoded picture on a display of an electronic device.

10. A method of encoding implemented by a video encoder, the method comprising:

generating, by the video encoder, a picture unit (PU) having a gradual decoding refresh (GDR) flag in a picture header (PH), wherein the GDR flag has a first value to specify that a picture associated with the PH is a GDR picture;

encoding, by the video encoder, the PU into a video bitstream; and

storing, by the video encoder, the video bitstream for communication toward a video decoder.

11. The method of claim 10, wherein the first value is one.

12. The method of claim 11, wherein the GDR flag is designated as ph_gdr_pic_flag.

13. The method of any of claims 11 to 12, wherein the PH contains a picture order count (POC) identifying a recovery point picture corresponding to the GDR picture in the PU.

14. A decoding device, comprising:

a receiver configured to receive a video bitstream including a picture unit (PU), wherein a gradual decoding refresh (GDR) flag in a picture header (PH) of the PU has a first value to specify that a picture associated with the PH is a GDR picture;

a memory coupled to the receiver, the memory storing instructions; and

a processor coupled to the memory, the processor configured to execute the instructions to cause the decoding device to:

decode the GDR picture from the PU to obtain a decoded picture.

15. The decoding device of claim 14, wherein the first value is one.

16. The decoding device of claim 15, wherein the GDR flag is designated as ph_gdr_pic_flag.

17. The decoding device of any of claims 15 to 16, wherein the PH contains a picture order count (POC) identifying a recovery point picture corresponding to the GDR picture in the PU.

18. An encoding device, comprising:

a memory containing instructions;

a processor coupled to the memory, the processor configured to implement the instructions to cause the encoding device to:

generate a picture unit (PU) having a gradual decoding refresh (GDR) flag in a picture header (PH), wherein the GDR flag has a first value to specify that a picture associated with the PH is a GDR picture;

encode the PU into a video bitstream; and

a transmitter coupled to the processor, the transmitter configured to transmit the video bitstream toward a video decoder.

19. The encoding device of claim 18, wherein the first value is one.

20. The encoding device of claim 19, wherein the GDR flag is designated as ph_gdr_pic_flag, wherein the first value is one, and wherein the PH contains a picture order count (POC) identifying a recovery point picture corresponding to the GDR picture in the PU.

21. A coding apparatus, comprising:

a receiver configured to receive a picture to encode or to receive a bitstream to decode;

a transmitter coupled to the receiver, the transmitter configured to transmit the bitstream to a decoder or to transmit a decoded image to a display;

a memory coupled to at least one of the receiver or the transmitter, the memory configured to store instructions; and

a processor coupled to the memory, the processor configured to execute the instructions stored in the memory to perform the method in any of claims 1 to 9 ~~and~~ or any of claims 10 to 13.

22. The coding apparatus of claim 20, further comprising a display configured to display a decoded picture.

23. A system, comprising:

an encoder; and

a decoder in communication with the encoder, wherein the encoder or the decoder includes the decoding device, the encoding device, or the coding apparatus of any of claims 15 to 22.

24. A means for coding, comprising:

receiving means configured to receive a picture to encode or to receive a bitstream to decode;

transmission means coupled to the receiving means, the transmission means configured to transmit the bitstream to a decoding means or to transmit a decoded image to a display means;

storage means coupled to at least one of the receiving means or the transmission means, the storage means configured to store instructions; and

processing means coupled to the storage means, the processing means configured to execute the instructions stored in the storage means to perform the method in any of claims 1 to 9 ~~and~~ or any of claims 10 to 13.

25. A computer-readable storage medium, wherein the computer-readable storage medium stores a computer program that can be executed by a processor, and when the computer program is executed by the processor, the processor performs the method according to any one of claims 1 to 9 or any one of claims 10 to 13.

26. A storage medium, wherein the storage medium stores a bitstream obtained by using the method according to any one of claims 1 to 9 or any one of claims 10 to 13.

27. A program comprising program code for performing the method according to any one of claims 1 to 9 or any one of claims 10 to 13 when executed on a computer or a processor.

28. A coder comprising processing circuitry for carrying out the method according to any one of claims 1 to 9 or any one of claims 10 to 13.