# HOW TO QC HDR DOLBY VISION FILES, AND HOW TO APPLY TRIM PASS:

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1. We need to make sure that the file we are working on has the Dolby Vision (DoVi) XML Metadata document present.
2. **We refer if no DoVi XML Metadata document present**.

3. **File Metadata matches the xml Dolby Vision metadata check.**
   **We check that the values present in the file metadata need to be consistent with the values in the Dolby Vision xml Metadata doc.**
   **If the values are not consistent, the file should be failed.**

4. **Our first picture Pass** is with the DoVi XML doc added:
   Load the file into the Iris, and load the XML metadata doc into the Iris after you put the file in.
   **Orange dots** will show below the video window of the Iris.
5. Turn the **HDR Simulation OFF** in the Options menu in Iris – Split screen box un- ticked.
   Turn off HDR Simulation in the dropdown menu of the Iris video window.
6. **Then do your QC.** (So, your first pass will be with the DoVi XML metadata loaded into the Iris but with the HDR simulation off - showing you the native HDR image)

   **The Trim Pass**
   The Trim pass is to check that the sync timings of the edits in the Metadata match the edits in the video.
   If there are any timing errors, they would appear like a mistimed grading error with the luminance level changing at a point other than a cut.

7. **Our second picture Pass** is with the Dolby Vision Trim pass applied - with the xml doc added:
   This is Split Screen: Original Picture on left / Metadata trim pass on Right.
8. **We turn on HDR simulation** / Options menu in Iris and ensure the Split screen box is ticked.
   And we turn on the HDR simulation in the dropdown of the Iris
9. It is recommended to use the 100-nit trim pass as this will give the greatest change in light level to the native level and so will make the most obvious difference in the light levels.

10. **Trim Pass Spot check:** If the Client is not paying for us to do a runtime of the Trim Pass, we will do a Spot Check of the Trim Pass
    (Start / Middle End to check sync timing – Run for 30 sec each / or over two shot edits).

## File and it's related xml Metadata Checks to be done before you start the QC

We don't need to worry about the Target Display, the things that need to be checked are the Colour Space of the file vs the xml Metadata document and then potentially the Mastering Display values & MaxCLL & MaxFALL.
Essentially, any of these values present in the file need to be consistent with the values in the metadata or the file should be failed.

**Colour Space**

**The first thing you need to do is check that:**
The Color Space in the file is the same in the DoVi metadata xml that is related to the file.

So, **in the file** it's in the usual place:

- Color primaries: BT.2020
- Transfer characteristics: PQ
- Matrix coefficients: BT.2020 non-constant

On the **xml metadata** it is under '**Color Encoding'** and you're checking to see if the Primaries are showing Rec.2020 or P3 values:

```
<ColorEncoding>
  <Primaries>
    <Red>0.68 0.32</Red>
    <Green>0.265 0.69</Green>
    <Blue>0.15 0.06</Blue>
  </Primaries>
  <WhitePoint>0.3127 0.329</WhitePoint>
  <PeakBrightness>10000</PeakBrightness>
  <MinimumBrightness>0</MinimumBrightness>
  <Encoding>pq</Encoding>
  <ColorSpace>rgb</ColorSpace>
  <SignalRange>computer</SignalRange>
</ColorEncoding>
```

**Mastering Display Information**

The next thing you need to check is the Mastering Display Information **if it's present in the file** to see that that matches the metadata.
So if it's present:

```
Mastering display luminance: min: 0.0001 cd/m2, max: 1000 cd/m2
```

Then on the **xml metadata**, check under '**Mastering Display**' that the values match:

```
<MasteringDisplay>
  <ID>7</ID>
  <Name>4000-nit, P3, D65, ST.2084, Full</Name>
  <Primaries>
    <Red>0.68 0.32</Red>
    <Green>0.265 0.69</Green>
    <Blue>0.15 0.06</Blue>
  </Primaries>
  <WhitePoint>0.3127 0.329</WhitePoint>
  <PeakBrightness>4000</PeakBrightness>
  <MinimumBrightness>0.005</MinimumBrightness>
  <DiagonalSize>42</DiagonalSize>
</MasteringDisplay>
```

**MaxFALL & MaxCLL**

Finally, if the file shows the MaxFALL & MaxCLL, then these will need to be checked against the metadata too.
So **on the file** it shows:

```
Maximum Content Light Level: 496 cd/m2
Maximum Frame-Average Light Level: 45 cd/m2
```

**On the xml metadata** it shows:

```
<MaxCLL>0</MaxCLL>
<MaxFALL>0</MaxFALL>
```

Note: It's not necessarily an issue that the file shows **'0'** as that is often done intentionally, but then we'd expect the file to be the same.

**See below for RGB primaries numbers for P3 or BT/Rec 2020**


**XML example given below: P3**

```
- <MasteringDisplay>
    <ID>7</ID>
    <Name>4000-nit, P3, D65, ST.2084, Full</Name>
  - <Primaries>
      <Red>0.68 0.32</Red>
      <Green>0.265 0.69</Green>
      <Blue>0.15 0.06</Blue>
    </Primaries>
    <WhitePoint>0.3127 0.329</WhitePoint>
    <PeakBrightness>4000</PeakBrightness>
    <MinimumBrightness>0.005</MinimumBrightness>
    <DiagonalSize>42</DiagonalSize>
  </MasteringDisplay>
- <TargetDisplay>
    <ID>1</ID>
    <Name>100-nit, BT.709, BT.1886, Full (HOME)</Name>
  - <Primaries>
      <Red>0.64 0.33</Red>
      <Green>0.3 0.6</Green>
      <Blue>0.15 0.06</Blue>
    </Primaries>
    <WhitePoint>0.3127 0.329</WhitePoint>
    <PeakBrightness>100</PeakBrightness>
    <MinimumBrightness>0.005</MinimumBrightness>
    <EOTF>gamma_bt1886</EOTF>
    <DiagonalSize>42</DiagonalSize>
```

**XML examples given below: BT/Rec - 2020**

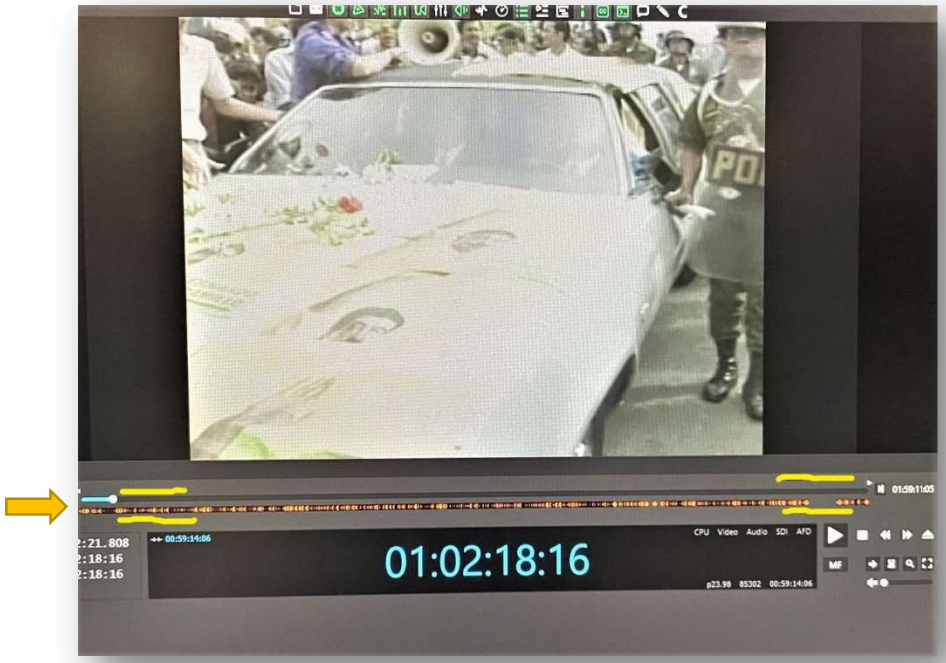
```
- <MasteringDisplay name="1000-nit, BT.2020, D65, ST.2084, Full" id="21">
    <ID>21</ID>
    <Name>1000-nit, BT.2020, D65, ST.2084, Full</Name>
  - <Primaries>
      <Red>0.708,0.292</Red>
      <Green>0.17,0.797</Green>
      <Blue>0.131,0.046</Blue>
    </Primaries>
    <WhitePoint>0.3127,0.329</WhitePoint>
    <MinimumBrightness>0.0001</MinimumBrightness>
    <PeakBrightness>1000</PeakBrightness>
    <Encoding>pq</Encoding>
    <ColorSpace>rgb</ColorSpace>
    <SignalRange>computer</SignalRange>
    <DiagonalSize>42</DiagonalSize>
    <BitDepth>16</BitDepth>
    <ChromaFormat>444</ChromaFormat>
  </MasteringDisplay>
- <TargetDisplay name="100-nit, BT.709, BT.1886, Full (HOME)" id="1">
    <ID>1</ID>
    <Name>100-nit, BT.709, BT.1886, Full (HOME)</Name>
  - <Primaries>
      <Red>0.64,0.33</Red>
      <Green>0.3,0.6</Green>
      <Blue>0.15,0.06</Blue>
    </Primaries>
    <WhitePoint>0.3127,0.329</WhitePoint>
    <MinimumBrightness>0.005</MinimumBrightness>
    <PeakBrightness>100</PeakBrightness>
```

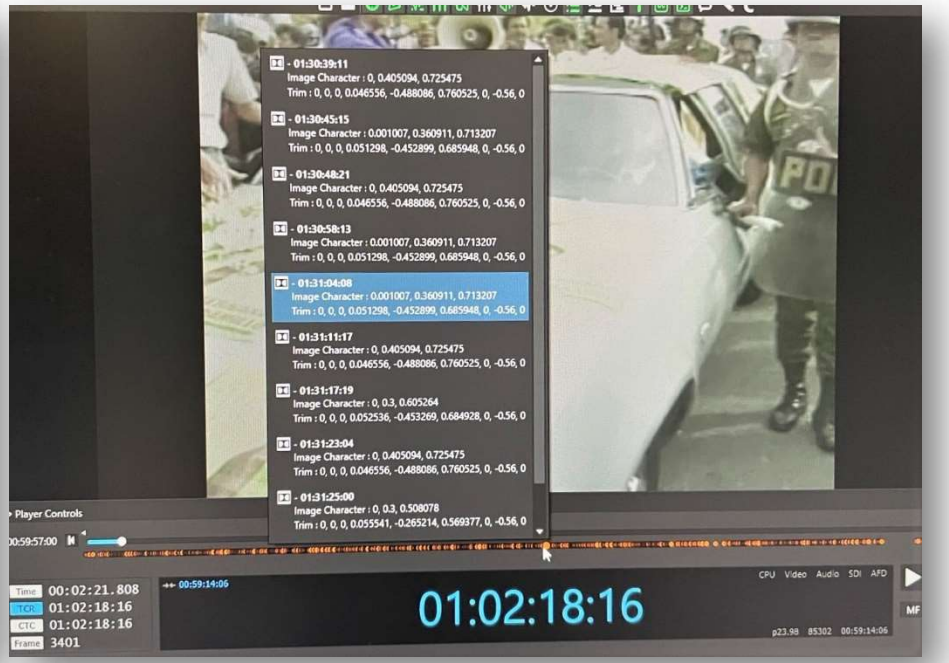
# HOW TO ON IRIS.

**Open the mov as usual.**
**Drag & drop the XML onto the Iris video window.**

**The DoVi timing data then appears above the timeline:**

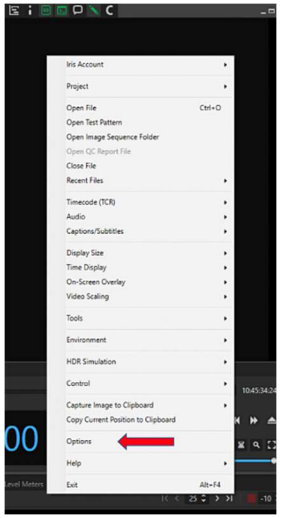

**When you hover over the dots with the cursor, the sync timings of the edits in the Metadata are visible.**



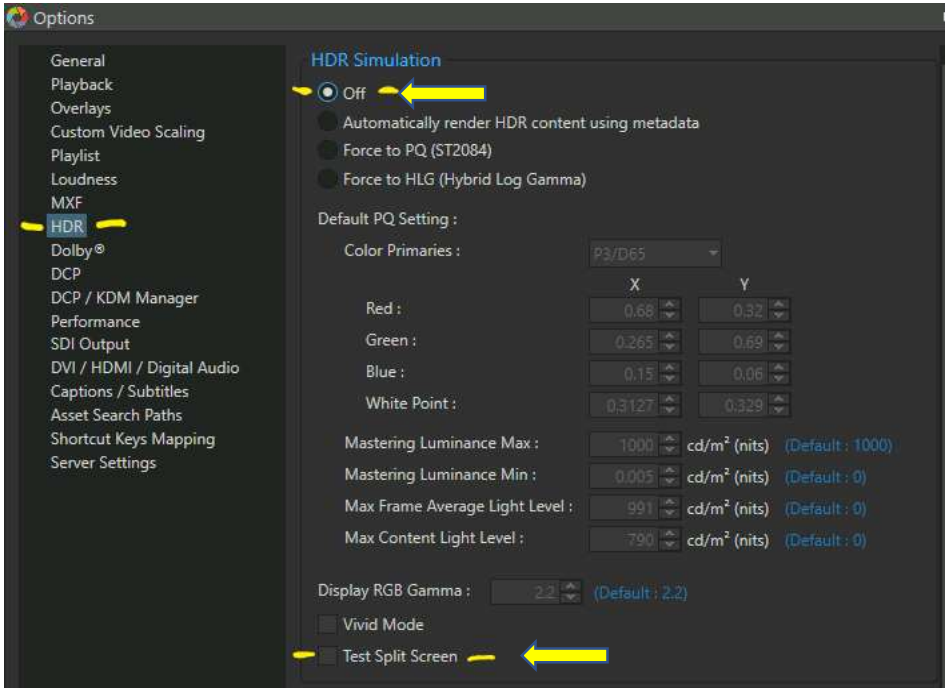
**FOR FIRST PICTURE QC PASS (without TRIM PASS).**

**First, right click on the Iris video window for the Options tab in the dropdown menu:**
**Select: Options**

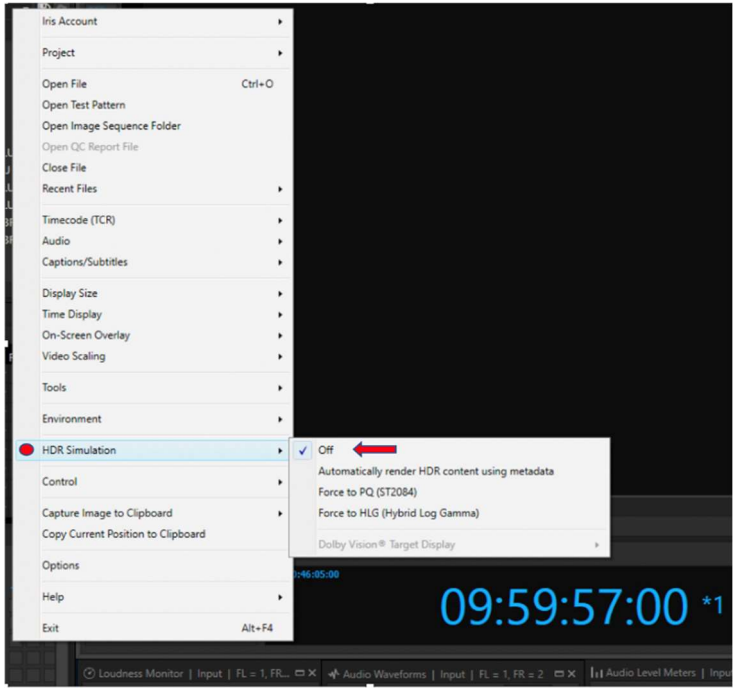


**In Iris Options menu:** Select **HDR** - Turn the **HDR Simulation OFF (tick Off box)**
**UN-TICK Test Split screen box.**
**In Iris video window:** Right click for dropdown menu. HDR Simulation box ticked **Off**

**On Options Menu:**
**HDR Simulation OFF.**
**Test Split Screen UN-TICKED**




**Video Window on Iris:**
Right click on Video Window for menu
**HDR Simulation Off.**

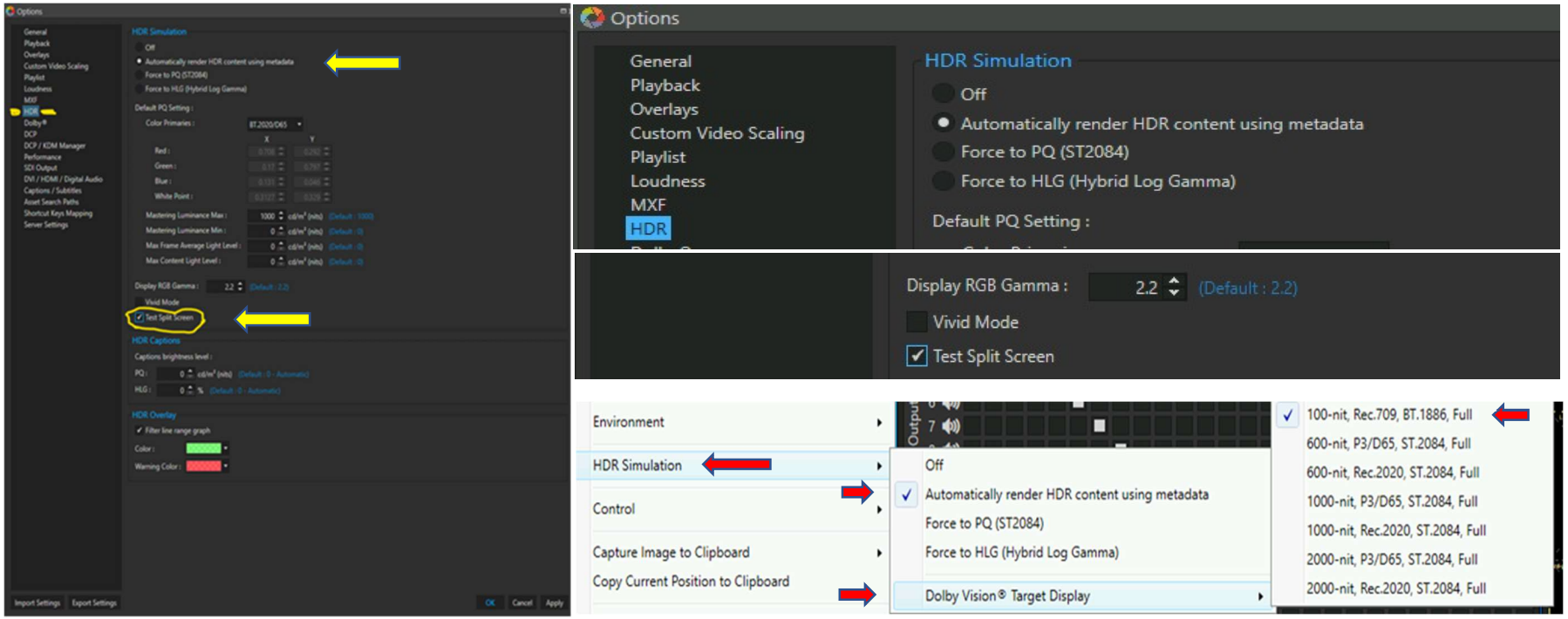


## FOR SECOND PICTURE QC PASS (with TRIM PASS).

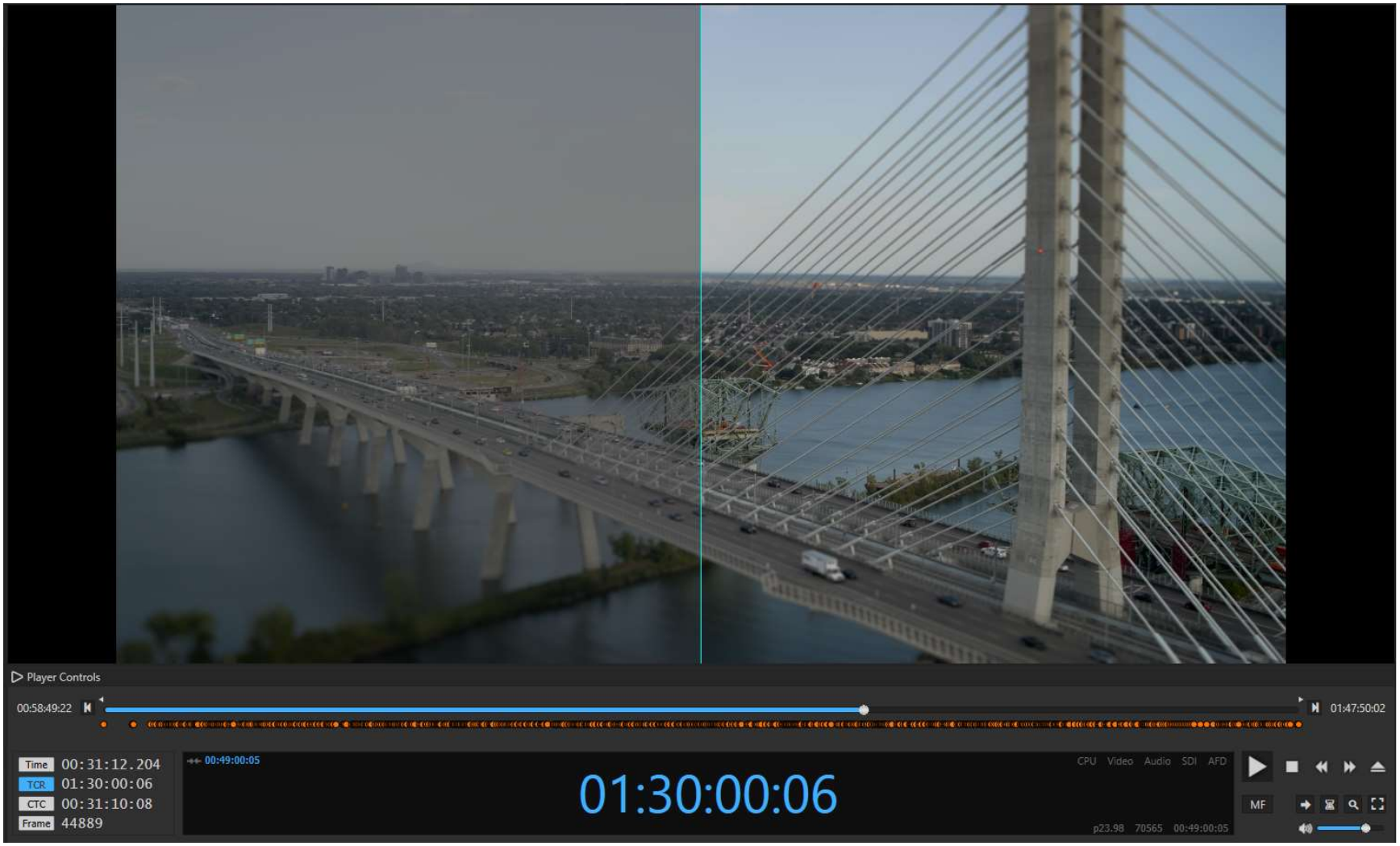
### FOR TRIM PASS:

**In Iris Options menu:** Select **HDR** - HDR Simulation - **Make sure the box 'Automatically render HDR content using metadata' is selected**
**Make sure the box 'Test Split screen' is selected.**

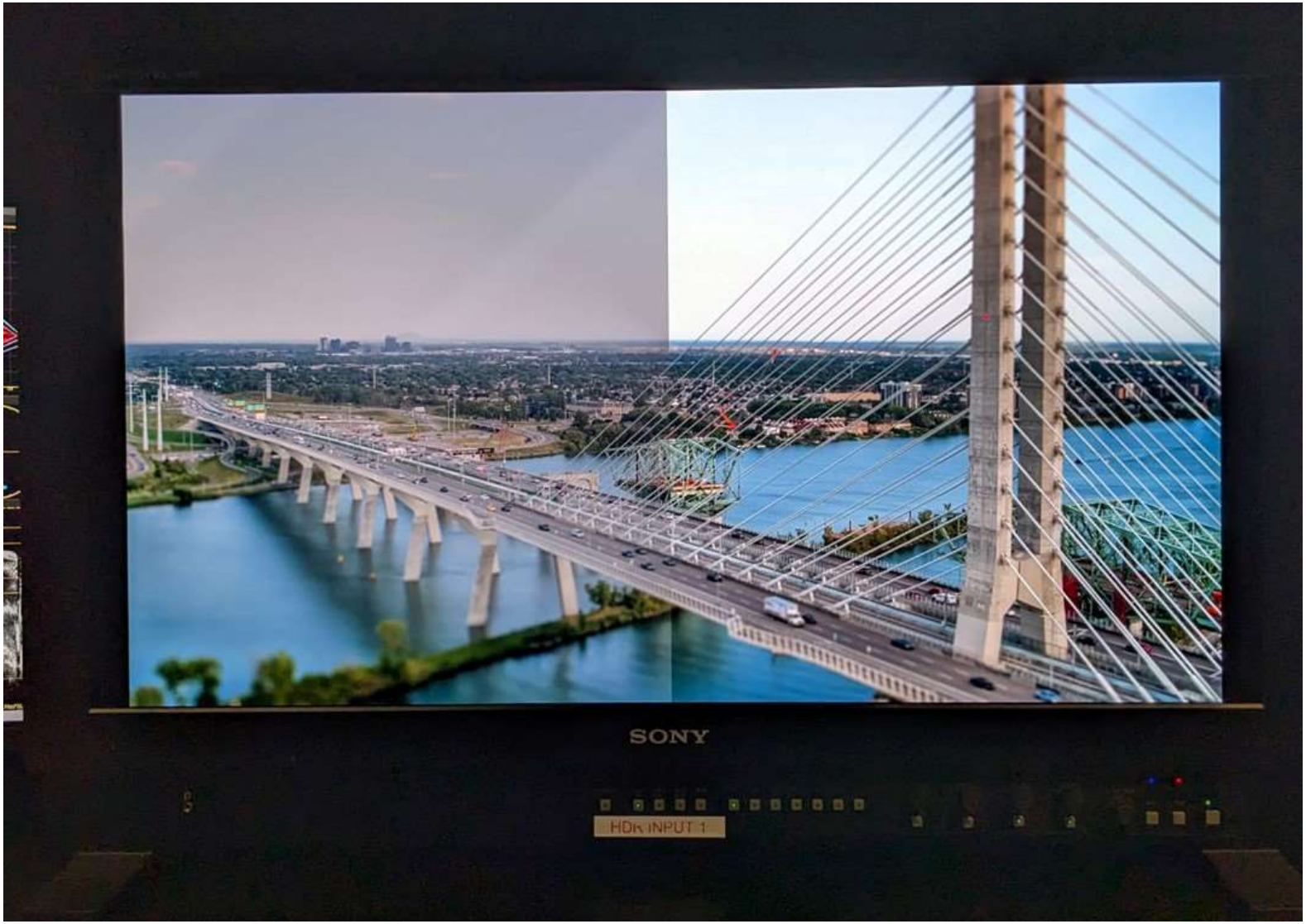
**In Iris video window:** Right click for dropdown menu - Select **HDR Simulation**:
Select: **Automatically render HDR content using metadata.**
Select: **Dolby Vision Target Display**: 100-nit, Rec 709 BT 1886, full
**Or you can then select the trim pass you need to use if the QC requests a specific one to be used.**



**This is an example of what a Split Screen Trim Pass Looks like on the Iris QC player.**
**(This should view the same on the QC Monitor)**



**This is an example of what a Split Screen Trim Pass Looks like on the QC monitor.**



## Notes on Colour Gamut details

While improved dynamic range is one key advantage of creating and delivering content in Dolby Vision (and HDR in general), the other key advantage is the ability to access a wider range of colours or wide colour gamut (WCG). While many home entertainment and broadcast use cases are built around the Rec. 2020 standard, no current display device is able to natively display the entirety of this colour gamut. The cinema-based DCI-P3 colour gamut (which most high quality HDR displays are able to reproduce 100% of) is often used as a reference gamut for studio content delivery specifications. Dolby Vision supports both DCI-P3 and Rec. 2020 colour gamuts, but because Rec. 2020 can not be accurately 100% reproduced by any display, many users opt into working with a DCI-P3 gamut inside of a Rec. 2020 container if their client's delivery specifications require 2020. Ultimately, the gamut you choose to work in will be driven by your client's needs, but it is important to consider whether or not the HDR display you may be evaluating supports your needed HDR colour gamut (or what percentage of the gamut is capable of being accurately reproduced).