Comment (i-426, 145.2.8.5.1, Page 159 Line 27):

- This comment is not about active current balancing.
- This comment is about the valid range of Rpse_min to keep Equation 145-15 accurate so when Rpse_min/max are used with the test verification model specified in Table 145-17, we will meet the values Icon-2P_unb in Table 145-16.

The main reason for the accuracy dependence on Rpse_min is:
Equation 145-15 was developed based on worst case 4-pair model components at short cable and long cable.
At short cable, we have total P2PRunb around 30%. if Rpse_min is increased, Rpse_max is increased too until the contribution of Rpse_min/max unbalance became higher that the contribution of the channel that is only 7% and the connectors that are ~25% resulting with total P2PRunb of >~30%.

The effect on the accuracy happen when Rpse_min is > 0.5 ohms at Class 7-8 and 1 ohm at class 5-6. This limitation is not relevant to active current balancing.

There are other side effects that will cause the PSE to not meet other requirements in the spec if Rpse_min max value will not be limited such as load regulation, PSE voltage range and power loss.

Proposed Remedy:
Add after line 27 in page 159:
"Equation 145-15 is only applicable for R_pse_min up to a value of 1 ohm for Class 5 and Class 6, and 0.5 ohm for Class7 and Class 8.
Add after line 53 in page 195:
"Equation 145-26 is only applicable for R_pd_min up to a value of 1 ohm.

<mark>END OF BASE LINE</mark>
See detailed analysis in the next Annex for the PSE. Similar analysis done for the PD.

Annex A: Why the maximum possible value of Rpse_min need to be limited in the specifications?

Rpse_min [Ω]	0.04	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.5	2	2.5
Class	Results: Difference from calculated to spec value [mA]													
Short Cable: 2.65m														
5	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
6	-1	-1	-2	-2	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1
7	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43
Long Cable 100m														
5	-65	-63	-60	-58	-55	-53	-50	-48	-46	-44	-42	-33	-25	-18
6	-42	-40	-36	-33	-30	-27	-25	-22	-20	-17	-15	-5	4	12
7	-14	-12	-9	-6	-2	1	4	6	9	12	14	25	35	43
8	-19	-16	-12	-9	-5	-2	1	4	7	10	13	25	35	45

Icon-2P_unb when Rpse_min up to 1 Ω for class 5 and 6, and 0.5 Ω for class 7 and 8 including 5mA margin.

Class	Icon-2P_unb			PASS/FAIL Calculated vs. Spec.	Difference between calculated and spec values			Max difference	To set spec. with 5mA margin from the max of (Calculated, Simulated, Spec)		To change Icon-2P_unb in D3.0
	Actual calculated	Spec	Simulations		Delta= Calculated - Spec	Max difference up to Rpse_min= 0.5 OHM	Max difference up to Rpse_min= 1 OHM				
	[A]	[A]	[A]		[A]	[mA]	[mA]	[mA]	[A]		[mA]
For 2.65m											
5	0.549	0.550	0.547	PASS	-0.001	-	-1	-1	0.554	To change to	554
6	0.680	0.682	0.679	PASS	-0.002	-	-1	-1	0.686	To change to	686
7	0.783	0.781	0.786	FAIL	0.002	2	-	2	0.793	To change to	793
8	0.889	0.932	0.866	PASS	-0.043	-43	-	-43	0.894	No change	932
For 100m.											
5	0.497	0.550	0.483	PASS	-0.053	-	-42	-42	0.513	No change	no change
6	0.655	0.682	0.639	PASS	-0.027	-	-15	-15	0.672	No change	no change
7	0.782	0.781	0.764	FAIL	0.001	1	-	1	0.788	To change to	788
8	0.930	0.932	0.912	PASS	-0.002	-2	-	-2	0.935	To change to	935

The final proposed numbers are the max of both tables.
See final spec numbers in darshan_03_0917.pdf for Icon-2P_unb that includes
PD calculations when connected to test verification model.