# FAQ for ESO Power Available tool

**Q: What is the calculation of minutes not in manual BOA (Bid Offer Acceptance) or FR (Frequency Response)?**

A: There is a real-time BMU Dispatch system in ESO which will log the BOAs with start time and end time. Specific logic within the real-time system will then assign the BOA status to each related BMU at each minute. There are four BOA status:
- Manually Instructed (BOA)
- Frequency Response
- Both BOA and FR
- Neither BOA nor FR

Therefore, the input data of the BOA status are BOA information logged/stored in the real-time system and the calculation of BOA minutes are merely based on such information.

**Q: What determines whether MO is good or MO is not good?**

A: MO = Metered Output and it is the real-time MW value received by the ESO EMS system. The real-time BMU Dispatch system mentioned above receives a MW reading from the EMS every 20 seconds and such MW reading is used for an accumulative minute average. The MW reading comes with a spot flag which will be set:

- True = Passed checksums and updated within expected timescales.
- False = Either failed checksums or not updated within expected timescales, or both.

If the spot flag is false for a 20sec reading, then the value is omitted from the minute average calculation.

The MO Quality Assurance Flag (on the report graph) is set to T(rue) if there is at least one acceptable reading for the minute and MO is Good for this minute. This flag is set to F(alse) if there are no readings for the minute and MO is Bad for this minute.

Therefore, the graph MO Quality Assurance flag is showing the number of the minutes when there is valid MW reading and when there is no valid MW reading for all involved Wind BMUs.

**Q: What determines whether PA is good or PA is not good?**

A: Similarly, real-time PA value is received by the ESO EMS system. The real-time BMU Dispatch system receives a PA reading from the EMS every 20 seconds and such PA reading is used for an accumulative minute average. The PA reading comes with a spot flag which will be set:
- True = Passed checksums and updated within expected timescales.
- False = Either failed checksums or not updated within expected timescales, or both.

If the spot flag is false for a 20sec reading, then the value is omitted from the minute average calculation.

The PA Quality Assurance Flag (on the report graph) is set to T(rue) if there is at least one reading for the minute and PA is Good for this minute. This flag is set to F(alse) if there are no readings for the minute and PA is Bad for this minute.

Therefore, the graph PA Quality Assurance flag is showing the number of the minutes when there is valid PA reading and when there is no valid PA reading for all involved Wind BMUs.



**Q: How the PA signal is assessed as being "Red" or "Not Red"?**

A: We talked about under what condition the MO and PA is Good during the minute. Now we need to know whether the minute is Good or not and then derive the Red Minute.
We define three checks:
- MO Good or not
- PA Good or not
- Comparison of MO & PA and the difference between MO & PA should be within tolerance

If all three are good or T(rue) then the minute is classed as "Good" or T(rue). If any one of these 3 checks are bad or F(alse) then the minute is classed as "Bad" or F(alse).

If there are 5 consecutive Bad minutes, then we will have a Red Minute and it will turn red on the BMU Dispatch screen to advice the control engineers.

As soon as there is 1 minute of Good minute, the red is removed from the BMU Dispatch system screen. Hence, we have a Not Red Minute.

For example, the 2023 October report shown that ESO Control Room saw Red Minutes for 38% of the time in October considering all involved Wind BMUs.