Task A1: Acquiring Telescope Pointing

# 3.1.2.1 Task A1: Acquiring Telescope Pointing

**Task A1: Acquiring Telescope Pointing**

Depending on the achieved performance of the telescope pointing, there are two different choices for initial acquisition to fix pointing and focus error:

1. When telescope blind focus error is expected to be more than 1” (i.e., > seeing, e.g., during commissioning, at the beginning of night, or after a large slew), the ESW configures the TCS to point the telescope to a J < 19 bright star (which can be either the TTF guide star or a nearby one) for pointing and focus correction (see Figure 3-6a and b).
2. When the telescope blind focus error is expected to be less than 0.2”, the blind pointing error is expected to be better than 1” (TCS meets the 1” RMS pointing error requirement, or after a short slew), and the OIWFS is used as the fast TTF sensor, the acquisition camera step is skipped, and the telescope is blind pointed to place guide stars on OIWFS and PWFS.

The telescope pointing acquisition is presented in Figure 3-6, representing the case 1 above, using IRIS as the pointing check camera. A similar sequence is generated for NSEN (not shown).  Details on this task are describe below:

1. The ESW asks the AOSQ to trigger an acquisition camera exposure if NSEN ACQ or IRIS is used; otherwise asks the IRIS/IRMS sequencer to take an image.
2. A dedicated ESW ACQ and TCS module retrieves the image. ESW ACQ displays the image.
3. In automatic mode:
   * the TCS module identifies the coordinate of the object with a pattern matching or box search algorithm.  Fall back to manual mode if automatic identification fails.
4. In manual mode:
   * the ESW ACQ module displays the message and lets the operator select the object.
5. The TCS module then computes the telescope offset based on the object position in the ACQ image, corrects atmospheric dispersion, and applies the offset demand.
6. Stop images from NSEN or IRIS
7. Move ISM back to the instrument (if needed)

![Figure 10. Acquire Telescope Pointing w/Iris Conceptual Actual](data:image/png;charset=UTF-8;base64,)

Figure 10. Acquire Telescope Pointing w/Iris Conceptual Actual

**Figure 3-6: Task A1-Telescope Pointing Acquisition with IRIS**