Sandia National Laboratories

H-FACET: Alignment Tool for Power Tower Heliostats

BENEFITS

- Compatible with power tower systems
- Easy to use; low cost
- Optimally concentrated solar flux
- Increased energy production and efficiency
- Reduced light spillage and operating cost
- Usable day and night

APPLICATIONS

- Heliostat alignment in power tower systems
- Misaligned mirror facet identification
- Mirror facet alignment

PATENTS PENDING

- SD 11629

LICENSING & PARTNERING

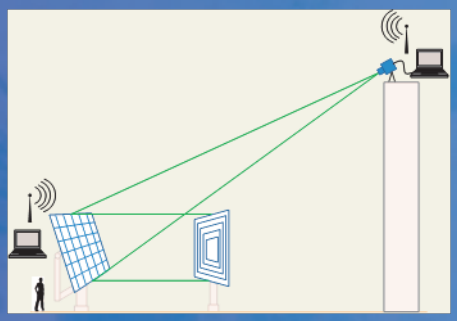
Various licensing and partnering options are available.

Please contact the Intellectual Property Department to discuss.

Technology Summary

Before alignment After alignment

Central receiver power tower systems can generate utility-scale electricity using a field of heliostats to reflect and concentrate sun light on a receiver. The heated liquid at the receiver creates steam to run steam turbines and generate electricity. A heliostat consists of an array of mirror facets. To obtain an optimally concentrated solar flux on the receiver, the individual facets on all the heliostats must be aligned (i.e. canted and focused).



Sandia has developed H-FACET as a unique and low cost option to diagnose the alignment state of heliostats. H-FACET is easy to use, accurate, and efficient in aligning heliostat mirror facets. H-FACET uses a high-resolution digital camera located on the central receiver tower and a target near the heliostat. The camera views the target in reflection through the heliostat. The ideal locations, or hit marks, of the target features are drawn over the live image for an easy and intuitive alignment process. The individual facets are adjusted until the reflected target features align with the hit marks. H-FACET is field and factory deployable and usable during the day or night.

Technology Readiness Level

Sandia estimates the technology readiness level (TRL) at 5. Key elements of the technology have been demonstrated in relevant environments.

Virginia Cleary | 505.284.8906 | vdclear@sandia.gov

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National Nuclear Security Administration

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