

Land-Based PV



The TALOS Platform for a Ground-Mounted Solar Plant

A single, easy-to-use platform that helps a solar plant team monitor the plant and guide autonomous robots (cleaning, mowing and inspection) from one screen.



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At the Cruz del Hierro hybrid plant near Ávila, Spain, a 56 MW solar-and-wind site with 28 MW of solar PV, TALOS demonstrates how a ground-mounted PV plant can be operated and maintained with the help of autonomous robots, all supervised through a single online platform.

Large solar plants face four everyday problems: dust and dirt on the panels (soiling) that lowers output, vegetation that has to be kept under control, hard-to-spot faults spread across thousands of panels, and the effort of coordinating several machines working in the same field. The TALOS Platform brings the plant's live data, practical maintenance suggestions, and a team of robots together in one place, so the plant team can decide and act quickly.

Traditionally, dirt levels are checked by hand, faults are found by walking the site, and cleaning or mowing is booked on a fixed calendar.

With TALOS, the impact of soiling is **estimated automatically** and addressed through well-timed cleaning, faults are flagged and ranked by how much energy and money they cost, and the plant manager simply reviews and approves **what the platform proposes**. Three things change for the team: the **process becomes more straightforward** (suggestions arrive as clear actions, not raw data); **human control stays explicit** (people validate, adapt or reschedule every mission); and **evidence is captured by default** (each job leaves a structured record). The project targets a reduction of up to 90% in human risk exposure, maintenance periods shortened by over 70%, and around 5% lower O&M costs.

This brief is about the platform the plant team sees and uses.

The robots and the intelligence behind them are described in the companion brief, Technical Brief 2 / 6.

The TALOS Platform is one online workspace, built by the project consortium. It takes a maintenance need from diagnosis all the way to a completed, documented robot mission.

On the same screen the team can view **plant status, plan and adjust missions, monitor robots live** (location, battery, progress and camera streams), react safely when conditions change, and open post-mission reports and fault maps. A stop control halts any robot at any time, and a short feedback form after each job helps the system keep improving. A training programme (an online introduction, an on-site session during the first field demo, and a follow-up) prepares the team to use the platform and work safely alongside the robots.



MONITOR

The platform watches the plant's production, weather and field conditions.



DETECT

It identifies and locates the issues that are dragging performance down.



RECOMMEND

It proposes a robot mission, or an alert for the team, ranked by the value it brings.



VALIDATE

The plant manager reviews and can adjust the mission (date, location, robot) or set it aside.



EXECUTE

The robot carries out the job under supervision, followed live on a map.



REPORT

Images, logs and results are stored automatically for follow-up.

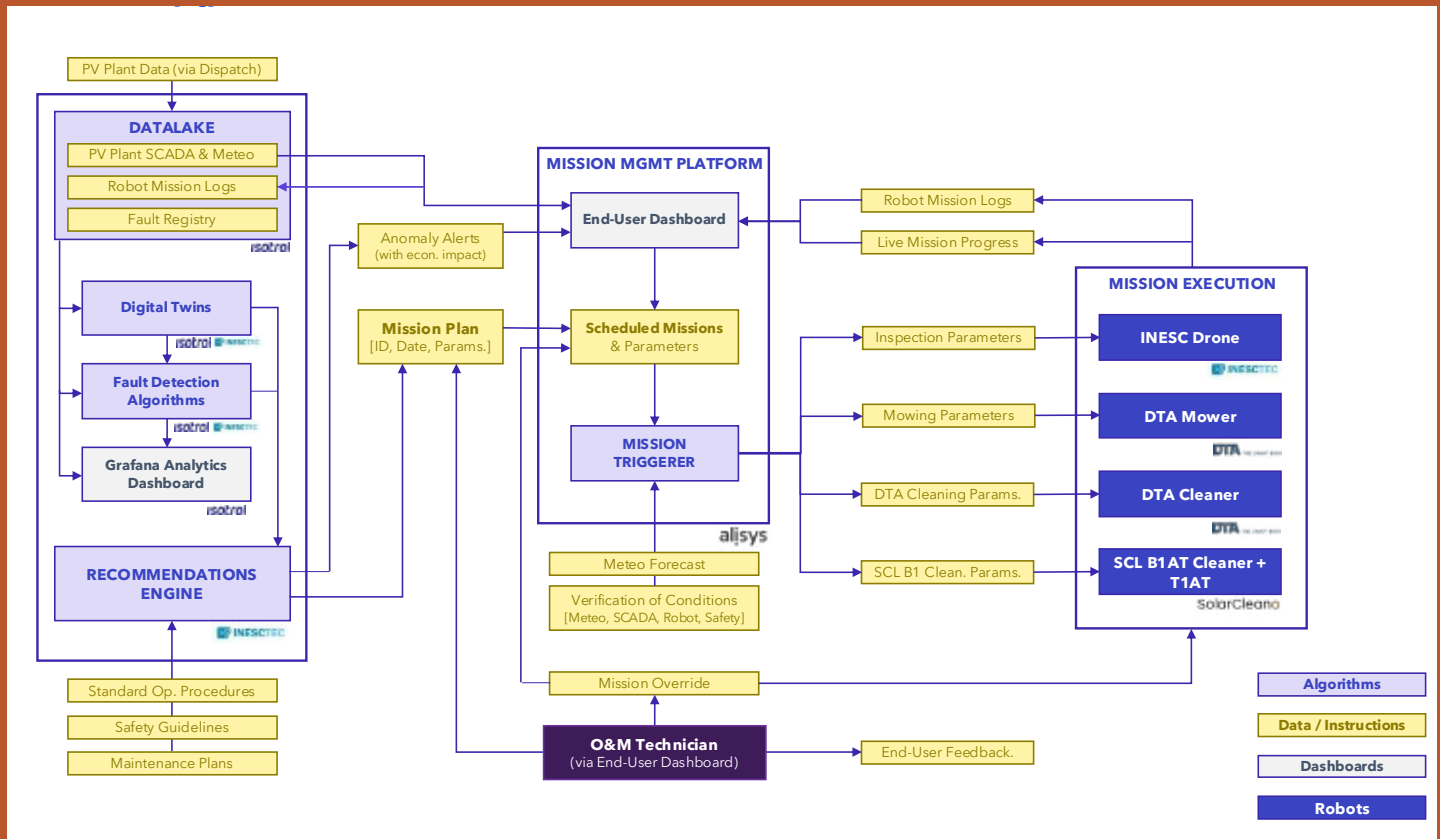


Figure 1. How information flows in the Land-Based PV pilot, from plant data and suggestions through robot missions and back.

Source: TALOS project.

In the morning the plant manager opens the platform and reviews the jobs the system has lined up overnight: a cleaning run on the dirtiest section, a mowing pass, and an inspection of an area flagged as under-performing.

They **approve the cleaning** and the inspection and hold the mowing for a drier day. Through the morning the cleaning robot works its way along the rows while its **progress is followed live**. When a new fault alert appears, the O&M team looks at the detail and brings the **inspection drones** forward. In the afternoon the drones fly their route and their images **confirm the problem**. At the end of the day the team submits **quick feedback on each job**, and all the **records are stored automatically**.

[Illustrative example. Real timings and the sequence of a typical demo day to be confirmed with the pilot team.]

Autonomous O&M works best when it is introduced as a supervised, scalable ecosystem, with people central to building trust and improving the system over time.

The platform delivers value to three groups:

FOR OPERATORS

Clear mission visibility and control, and less time spent on inspection, cleaning and mowing.

FOR ASSET MANAGERS

Traceable records and evidence for follow-up, and data-driven identification of problems and O&M planning.

FOR PLANT OWNERS

More scalable maintenance routines, with potential to lower long-term costs and improve return on investment.

Recommendations from the TALOS Land-PV experience

- **Supervise autonomy, especially during early roll-out:** keep the team validating scheduling and execution to reduce risk, spot improvements and build confidence.
- **Plan the logistics that make autonomy work:** more frequent robotic jobs need the right support (robot upkeep, water availability, charging infrastructure).
- **Adapt roles, procedures and training:** teams need updated safety rules and new skills to supervise autonomous work effectively.
- **Treat the platform as a future-proof layer,** being robot-agnostic, it can take on additional robots and O&M tasks as trust grows.

GLOSSARY

O&M	Operations & maintenance: the day-to-day running and upkeep of the plant.
Soiling	Dust, dirt or droppings on the panels that reduce their energy output.
SCADA	The plant's existing monitoring system that reports production and equipment data.
Drone (UAV)	A small uncrewed aircraft used to inspect the panels from the air.
Ground vehicle (AGV)	A self-driving machine that cleans or mows on the ground.

PROJECT PARTNERS BEHIND THE PLATFORM



User interface and mission management of the platform.



Central store of plant data (feeding the platform's live views and analytics).



Maintenance suggestions and fault alerts shown on the platform.



Training programme and feedback tools.



Plant owner and O&M team: requirements, on-site training and validation.



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