
BMU Factory and Site Acceptance Testing: What FAT and SAT Actually Verify — and What They Don't

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A factory acceptance test, or FAT, is the testing of a building maintenance unit at the manufacturer's works, before shipment: the machine is assembled, exercised through its functional sequences, tested under load, its safety devices demonstrated, and its documentation reviewed against the purchase specification. A site acceptance test, or SAT, is the testing of the erected system on the building it will serve: the machine on its track or supports, through its parking, deployment, and operating envelope, at its interfaces with the structure, ahead of handover into service. The distinction that matters to an owner is simple to state: the FAT principally verifies the machine; the SAT principally verifies the erected installation; neither substitutes for the other. Each test answers the questions its scope contains, for the parties whose questions they are — and the owner's position at both tests is determined less by what the contract says will be tested than by who, at the test, is asking on the owner's behalf.

What a factory acceptance test verifies

A FAT conducted with full purpose examines the machine as a machine. Functional sequences — travel, slewing, luffing, telescoping, hoisting — through their ranges. Performance under load, including the overload conditions the safety devices exist for. The devices themselves, demonstrated rather than assumed: overload detection, overspeed response, secondary braking, limits, emergency functions. Dimensional and configuration conformity against the approved drawings. And the documentation — test certificates, material records, component records, load charts, manuals — reviewed as part of the acceptance rather than received as a parcel with the machine. The FAT is a particular opportunity in the machine's life: it can be examined complete, exercised under load, and corrected while it still stands at the works — where the machine, the people and tooling needed to address a finding, and the principal delivery responsibility remain concentrated in one place.

That location is the point. In the failure modes article in this series, I described a drivetrain component that failed under pre-delivery load testing on a machine whose documentation was in order — a condition found because the machine was exercised under load with an independent engineer present, at the works, before shipment. What acceptance testing buys the owner is not certainty; no test delivers that. It is position: discovery at the works, before shipment, while the machine and the resources needed to investigate and correct a finding remain together — rather than discovery after erection or in service, when custody, contractual relationships, and available remedies may be different.

What the FAT does not verify

A machine that has passed its FAT has demonstrated itself in the factory's conditions: on the factory's supports, at the factory's temperatures, against the factory's power supply, in a test rig that approximates — but is not — the building. The FAT does not verify the erected system. It cannot examine the interfaces the machine will actually live on: the track and its fixings, the corbels and anchorages, the restraint and tie-in provisions, the structure beneath all of it — the machine–building joint that the failure modes article treats as a category of its own. It does not verify the operating envelope on the real façade, the reach and clearance conditions at the real geometry, the parking and deployment behavior in the real wind exposure, or the rescue provisions as they will actually be executed. And it does not verify transport and erection: the machine that passed its FAT is then disassembled, shipped, handled, stored, and re-erected — and the system that emerges from that sequence is the one the owner will operate. Those are the SAT's questions, and a FAT sign-off, however thorough, does not discharge them.

What a site acceptance test verifies

The SAT examines the system where it will spend its service life. The erected machine on its permanent supports, through its full operating envelope on the actual building. The interfaces, loaded: track, fixings, anchorages, restraint provisions, under the loads the machine imposes in use. The building-side provisions the machine depends on — power, controls integration, drainage, parking accommodation. The conditions the factory could only approximate — geometry, exposure, access for the people who will operate and maintain it. And the completion of the acceptance record: as-erected configuration, test results, the documentation set that will govern the system's service life. The SAT is also where the machine's conformity meets the asset's regime — which, for an imported machine, is a subject with a structure of its own. And where the project's schedule calls for the system to be used before acceptance is complete — beneficial use, construction use — the decision structure that governs that period, and what the available evidence can establish about conditions that surface in it, are subjects of their own, addressed separately in this series.

Two reference systems, one machine

A substantial part of this subject arises from a structural fact of the industry: a machine may be designed, manufactured, and factory-tested under EN 1808, a principal European standard for suspended access equipment, and then erected on an asset governed by the US framework — OSHA 1910.66 for the installed powered platform, ASME A120.1 as the consensus standard, and whatever jurisdictional requirements attach to the building. These frameworks were written by different bodies answering differently framed questions, and conformity with one is not, by itself, conformity with the other. One specification approach addresses this directly: cite the applicable international and local requirements; establish how differing requirements are reconciled — the most stringent governing, sometimes with a stated hierarchy for genuine conflicts; assign responsibility for that determination; and require documented confirmation at commissioning. That structure allocates the

task. It does not, by itself, perform the engineering reconciliation. Three things follow. 'Most stringent' reads like arithmetic and is actually engineering: regimes that differ in framing do not rank neatly, so stringency must be determined requirement by requirement, by someone, and documented. The party owing the confirmation may sit within the delivery chain — possibly an intermediary who purchased the machine from its manufacturer — so the confirmation arrives as a representation from within the chain that delivered the machine. And the compliance certificate issued at commissioning is a conclusion: the acceptance record should contain its basis. Acceptance is a critical point at which the basis for those conclusions can be examined on the owner's behalf — before unresolved questions pass into the operating life of the asset, where the owner holds them. Acceptance is the point at which unresolved specification questions begin becoming operating or retrofit questions.

Who attends, and for whom

Every party at an acceptance test attends within a scope. The manufacturer demonstrates the machine against the applicable delivery and acceptance requirements. The purchaser's project organization — where the machine is bought through a contractor chain — verifies the requirements within its procurement scope. A witnessed test answers to the witness's scope, and the tests performed are the tests the parties present require. So the question an owner should ask about any acceptance campaign is not whether a FAT and SAT occurred, but: who, at each, was asking the owner's questions — the lifecycle questions, the conformity-correspondence questions, the documentation questions — as distinct from the delivery questions the contract chain is structured to ask? Where the answer is no one, the acceptance record that results is a record of delivery, and the owner's questions remain open, unasked, and attached to the asset. In acceptance campaigns I have conducted as an independent engineer, the tests that produced findings were, in a number of instances, tests that were on no one else's list — not because any party withheld them, but because they belonged to a scope no attending party carried.

The acceptance file is the owner's record

What leaves acceptance testing, besides the machine, is the file: test records, certificates, load charts, as-built and as-erected configuration, manuals — a documentary basis for future inspection, service decisions, and, if necessary, investigation. The first article in this series described documentation decay: acceptance is the first opportunity to establish the complete baseline record, while the project participants and the source information are still available. An owner who treats the acceptance file as a courtesy copy of the contractor's paperwork holds, decades later, whatever survived. An owner who receives it as the asset's founding engineering record — reviewed for completeness at acceptance, held as owner's records, referenced in the service relationship — holds the baseline against which every later question about the system can be measured. The difference is comparatively easy to establish at acceptance. It can be difficult to reconstruct later.

The practical posture for an owner or project manager

The posture follows from the structure. Specify acceptance testing — factory and site — in the purchase contract, with scope, load cases, safety-device demonstrations, and documentation deliverables named rather than implied. Align payment milestones to acceptance stages, so the commercial position and the technical position move together. Decide, before the FAT, who attends on the owner's behalf and what questions they carry — including the correspondence question, where the machine's originating standard and the asset's governing regime differ. Where the specification binds the supplier to the most stringent of several regimes, require the stringency determination itself — which requirement governed, on which points, and why — as a documented deliverable rather than an implied one. Treat the SAT as a distinct verification with its own scope, not a repetition of the FAT on location. And receive the acceptance file as the founding record of the asset: reviewed, complete, and held. None of this expands the project; it arranges what the project already contains so that the owner's questions are asked while the project participants, records, and contractual mechanisms remain available.

Rauch Safety & Engineering provides independent engineering presence at factory and site acceptance testing — attending on the owner's behalf, conducted independently of the equipment supply chain and the contract delivery chain, with the findings and the acceptance record belonging to the owner. For systems already in service, the same questions are addressed through the Installed Systems Engineering Review™. RSE does not sell equipment, perform service work, or compete with the parties who do; its role is to provide an independent engineering record outside those commercial relationships.

Standards designations current as of August 2026 (EN 1808:2015; ASME A120.1-2021; 29 CFR 1910.66). Users are responsible for verifying the current text of any standard or regulation applicable to their project and jurisdiction.

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