

AMAZON PROTEUS · ASAP PLATFORM

\$30M+ in cost avoidance and deployment six months sooner: how Amazon built Proteus's safety case on the ASAP Platform.

Amazon's Proteus is a cross-docking autonomous mobile robot operating at scale across fulfillment facilities. Taking a fully autonomous, AI-driven system of that scale through certification demands rigorous functional safety work and third-party assessment: historically, weeks of review standing between finished engineering and commercial deployment. **By building the safety case on Fennec's ASAP Platform, the Proteus program moved certification off the critical path,** with safety evidence produced continuously in a standardized form assessors could work from directly.

AT A GLANCE	
INDUSTRY	Advanced Robotics / Autonomous Mobile Robots
APPLICATION	Functional safety certification of a cross-docking AMR deployed at scale across fulfillment facilities
STANDARDS	IEC 61508-3, with ISO 13849 within the assessed scope. ASAP tools T2-qualified by TÜV Rheinland.
SOLUTIONS	ASAP Platform (hazard analysis through certification evidence in one traceable system) with the Validation module (auto-generated, assessor-ready reports)
OUTCOME	Certification moved off the critical path.

\$30M+ Cost avoidance from timeline compression and eliminated rework	~6 mo. General Availability readiness pulled forward	One system Hazard analysis through certification evidence, traced end to end	T2 ASAP tools under IEC 61508-3 by TÜV Rheinland
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The challenge

Deploying a fully autonomous system at Proteus's scale demands rigorous functional safety work, often involving a third party such as a Nationally Recognized Testing Laboratory. For complex AI-driven systems, where safety guarantees are probabilistic rather than deterministic, that process has historically been complex at best and a program-halting bottleneck at worst.

Traditional certification workflows create three compounding problems for the builder.

Safety data doesn't travel

Data produced during design rarely moves cleanly into deployment contexts, forcing teams to chase edge cases and scenarios never anticipated in the business case.

Disconnected toolchains create gaps

Spreadsheets, Word documents, and legacy safety tools produce traceability gaps that burden internal teams and trigger rounds of follow-up questions from assessors.

Review cycles stall launch

Once testing concludes, certification bodies typically require weeks and multiple rounds of questions before signing off, leaving finished engineering work behind manual review.

For a program of Proteus's scale and urgency, this was an unacceptable bottleneck between engineering completion and commercial deployment.

The solution: the certification lifecycle on ASAP

The ASAP Platform, the functional safety platform within Fennec's Advanced Safety Acceleration Program, connects the functional safety lifecycle in a single traceable system. Each phase of the Proteus program answered one of the three failure modes above.

DESIGN No end-of-program scramble

Hazard analysis, safety concept, and functional safety requirements were authored directly in ASAP, with rationale captured inline and every connection between requirements and evidence maintained automatically. Documentation was always current, never reconstructed at the end of the program.

VERIFICATION Evidence that assembles itself

As test evidence was generated, ASAP linked it to its parent requirements. The Validation module produced standardized, assessor-ready reports as evidence accumulated, removing the manual report-assembly stage.

PRE-CERTIFICATION A qualified toolchain

Fennec's ASAP tools are qualified by TÜV Rheinland as Tool Class 2 (T2) offline support tools under IEC 61508-3:2010, Clause 7.4.4. Assessors could rely on the tools' qualification rather than re-qualifying the toolchain, and the team did not carry the burden of re-validating tools before assessment.

CERTIFICATION REVIEW Standardized evidence, focused review

With a traceable, standardized technical file in a format assessors had built familiarity with, the review stayed focused. The Safety Requirements Specification and Safety Concept were reviewed in detail, line by line. The software source-code reports, in a consistent format, were spot-checked. As on any program of this scope, the assessment included working meetings and an open-items list. The consistent structure of the evidence kept the review efficient rather than stalled on reconstructing traceability.

Certification stopped being the bottleneck. Engineering completion and commercial deployment were no longer separated by *weeks of reconstructing evidence*.

Results

~6 months of GA acceleration. Certification time was reduced enough to pull General Availability readiness forward by roughly six months, a strategic advantage in a competitive, time-sensitive market.

\$30M+ in cost avoidance. Compressing the certification timeline and eliminating rework contributed an estimated \$30M+ in cost avoidance.

Certification off the critical path. The final assessment became a step the program had prepared for continuously, rather than a gate it waited behind.

Broader impact: safety infrastructure at scale

The Proteus certification is one milestone in a longer effort. The connected safety infrastructure underlying ASAP, originally developed inside Amazon's robotics organization, now supports a large autonomous mobile robot fleet operating across facilities. Fennec Engineering has since made the ASAP Platform publicly available, extending this capability to any manufacturer working to compress certification timelines and build durable, reusable safety evidence.

For advanced manufacturers operating at the intersection of automation, AI, and functional safety, the lesson is consistent. When safety data is structurally connected from design through deployment and into ongoing operation, certification shifts from a bottleneck to a competitive advantage.

Key standards & qualifications: IEC 61508-3 T2-qualified · ISO 13849 within the assessed scope · TÜV Rheinland

QUALIFICATION REFERENCE

Fennec's ASAP tools are qualified by TÜV Rheinland Industrie Service GmbH (Cologne) as Tool Class 2 (T2) offline support tools under IEC 61508-3:2010, Clause 7.4.4, each at a specific assessed version: Hazard Analysis and Safety Concepts, report 968/INS 870.00/24 (2024-09-17); Validation, report 968/INS 870.01/25 (2025-08-26, v0.4.129); Requirements and Systems Design, report 968/INS 870.02/25 (2025-12-08, UI 0.1.201 / UI 0.0.128); Reliability, report 968/INS 870.05/26 (2026, UI 0.5.181). Qualification applies within the assessed scope. Correct selection and application of the tools remains the responsibility of the user.