

COMPANY STANDARD

ELNAV.AI Company Standard

for Seafarer-Centred AI Deployment

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EFFICIENCY IS NOT A SAFETY CASE. ELNAV.AI shall not approve, activate or materially support an operational deployment within its role and control where the claimed benefit depends on transferring unassessed safety risk, additional workload or undisclosed surveillance to seafarers.

Document control

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Draft V0.1	03 August 2026	Draft	Initial company standard for review
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1. Purpose and status

1.1 Purpose

This Standard establishes the conditions under which ELNAV.AI may design, develop, evaluate, pilot, supply, integrate, materially advise on or materially modify an AI-enabled system that affects seafarers.

It converts ELNAV.AI's seafarer-centred position into project requirements, evidence gates, hold conditions, assigned responsibilities and recorded decisions. Its purpose is to prevent claimed efficiency, automation or data value from being achieved by transferring unassessed risk, workload, loss of authority or undisclosed surveillance to the people who operate and support ships.

1.2 Company standard, not external certification

This is a voluntary internal ELNAV.AI company standard. It is not an IMO, ILO, ISO, class, flag-State or statutory standard. It is not legal advice, certification, approval, conformity assessment or a representation that any product, vessel, operator or deployment complies with applicable law or technical rules. Application of this Standard does not certify a system, vessel, operator or deployment and does not by itself establish legal or regulatory compliance.

This Standard does not replace project-specific assessment of applicable law, flag-State requirements, classification rules, equipment approval, labour and worker-participation duties, data protection, cybersecurity, contractual obligations, the operator's Safety Management System, safe-manning obligations, collective agreements, employment duties or competent professional advice. Competent professional advice shall be obtained where required by the applicable project, law, contract or level of risk. Applicable legal and regulatory requirements prevail in the event of conflict. Where requirements are compatible, ELNAV.AI shall apply the requirement that provides the stronger protection for safety, dignity and affected persons.

This Standard does not create a third-party certification scheme or modify contractual rights or liabilities unless it is expressly incorporated into a contract.

1.3 Normative language

In this Standard:

- **shall** identifies a mandatory ELNAV.AI requirement;
- **should** identifies a recommended practice that may be varied with documented reasoning; and
- **may** identifies permission or an available option.

The word **operator** is used as a practical project term and does not determine whether an entity is a provider, deployer, controller, processor, employer or another regulated actor under applicable law. Those roles shall be established for each project.

2. Scope and applicability

2.1 Activities in scope

This Standard applies whenever ELNAV.AI materially:

- designs, develops, configures or evaluates an AI-enabled system;
- conducts or supports an offline evaluation, live test or controlled pilot;
- supplies, licenses, installs, commissions, integrates or supports a system;
- advises on selection, intended use, configuration, acceptance, operational procedures or governance; or
- modifies a deployed system, its model, sensors, data flows, user interface, alerts, integrations or permitted use.

It applies whether the system is owned by ELNAV.AI or by another party, and whether the relevant function is performed on board or ashore.

2.2 Effects in scope

The Standard applies when the system can materially affect one or more of the following:

- navigation, watchkeeping, collision avoidance or bridge-team coordination;
- alarms, alerts, communications, information presentation or situational awareness;
- task allocation, workload, fatigue exposure, rest, staffing or supervision;
- human authority, intervention, takeover, fallback or emergency action;
- training, familiarisation, competence assessment or operational review;
- collection, inference, retention, export or use of seafarer-linked data; or
- decisions about a seafarer's work, conduct, performance, health, employment or access to work.

2.3 Material advisory support

Advice is material where ELNAV.AI knows or should reasonably expect that it can influence a specific system's selection, configuration, acceptance, deployment, operational use or governance. General conference remarks, public education and commentary that are not connected to a specific deployment are outside scope.

2.4 External-party cooperation

This Standard binds ELNAV.AI. It cannot transfer an operator's legal or operational responsibilities to ELNAV.AI. Where compliance depends on an operator, employer, integrator, vessel manager, owner,

vendor or other party, ELNAV.AI shall make its continued participation conditional on documented cooperation and allocation of responsibility. Refusal to provide required information, access, assessment, training, safeguards or acknowledgement is a hold condition.

2.5 Lifecycle coverage

The Standard applies from first deployment-related advice through retirement of ELNAV.AI's involvement. A project shall not avoid a gate by describing live operational use as research, demonstration, trial, proof of concept or shadow mode.

3. Terms and definitions

3.1 Affected seafarer

A person working on board whose tasks, attention, authority, safety, working conditions, personal data or employment interests can reasonably be affected by the system. Where relevant, the protections in this Standard shall also be applied to shore-based workers supporting ship operations whose work or interests can be affected in the same way.

3.2 AI-enabled system

A software, hardware or combined system that uses machine learning, statistical inference, computer vision, natural-language processing, automated decision logic or another data-driven method to generate content, predictions, detections, recommendations, classifications, alerts or control actions. This functional definition is broader than, and does not replace, any legal definition.

3.3 Controlled pilot

A time-bounded, documented and supervised live evaluation with defined users, operating conditions, acceptance criteria, stop criteria, fallback and review. Unless separately approved, pilot output is advisory and shall not be the sole basis for a safety-critical, staffing, disciplinary, medical or employment decision.

3.4 Deployment

Any project stage in which a system is made available for use, tested in a live work setting, connected to operational equipment or data, or used to influence work or decisions. Deployment includes commissioning, pilot use, operational use and material change.

3.5 Enhanced-risk configuration

A configuration that materially increases risk to safety, rights or dignity. Examples include raw audio or video recording or export, voice or identity profiles, named individual scoring, biometric or health-related data, emotion inference, shore-side export of seafarer-linked data, employment-related use, or automated control with demanding takeover expectations.

3.6 Fallback

The practicable and tested means by which safe operation continues or is restored when the system is unavailable, degraded, uncertain, inappropriate or intentionally deactivated.

3.7 Material change

A change that can alter intended use, users, operating conditions, performance, risk, workload, authority, data processing, alerts, integration, fallback or claims. A material change reopens the affected deployment gates.

3.8 Operator

The shipowner, ship manager, employer, vessel operator, shore control organisation or other project party that controls the work setting or operational use. The project record shall identify the precise entity and its legal roles.

3.9 Operational deployment

Use in which system output, alerts, recommendations or control actions are relied upon in real operations or incorporated into routine procedures, work allocation, monitoring or decisions.

3.10 Surveillance purpose

Use of seafarer-linked data to routinely observe, identify, profile, rank, discipline, measure productivity, evaluate personal conduct or performance, infer health or psychological state, or support employment decisions beyond a clearly disclosed and assessed immediate operational safety purpose. The presence of a camera, microphone or sensor does not by itself establish a surveillance purpose; purpose, configuration, access and downstream use determine the assessment.

4. Core commitments

4.1 Safety and dignity before claimed efficiency

ELNAV.AI shall treat safety, dignity and decent work as deployment constraints, not as benefits to be assumed after commercial or technical decisions are made. A financial, staffing, fuel, schedule or productivity benefit is not evidence that a deployment is safe or acceptable.

4.2 Human authority must be real

Where a person remains accountable, that person shall have sufficient information, time, competence, authority and practical means to understand the system state, question its output, intervene, disengage it and use the fallback. A nominal override that cannot be exercised under realistic workload and time pressure does not satisfy this commitment.

4.3 Evidence before escalation

Deployment shall progress only on evidence appropriate to the intended use and stage. Marketing language, laboratory accuracy, a successful demonstration, absence of reported incidents or compliance with nominal rest hours shall not be treated as a complete safety case.

4.4 Seafarers participate before decisions are locked

ELNAV.AI shall design its deployment process to seek representative operational input early enough to influence relevant design and configuration decisions. The operator remains responsible for worker information, consultation and representative engagement required by law, agreement or its employment arrangements. Where ELNAV.AI is given reasonable access, it shall provide a practical route for affected seafarers to raise concerns directly or through a representative.

4.5 Workload is assessed, not assumed

The project shall examine total work as performed, including monitoring, verification, mode management, data entry, alert response, maintenance, handover, takeover and recovery. Removal of one manual task shall not be presented as workload reduction without assessing new cognitive and coordination demands on board and ashore.

4.6 Data use is purpose-limited and proportionate

ELNAV.AI shall use the least data-intensive configuration reasonably capable of meeting the documented safety purpose. Safety-support data shall not become a hidden channel for routine discipline, productivity monitoring, identity tracking, psychological inference, medical diagnosis or employment evaluation.

4.7 Failure must be visible and recoverable

Users shall be able to recognise relevant system modes, limitations, degraded inputs and failure states. Fallback, deactivation and rollback shall be practicable and tested before operational dependence.

4.8 Learning is system-oriented

Post-deployment review shall examine interactions among tasks, people, procedures, equipment, environment and organisation. Individual action shall not be treated as a sufficient root cause where system conditions, workload, design or organisational factors require examination.

5. Deployment classification

5.1 Stages

Stage	Meaning	Permitted decision
A - Offline evaluation	No live operational influence. Data and system outputs are evaluated without directing work or safety decisions.	ELNAV.AI participation approved - offline evaluation

Stage	Meaning	Permitted decision
B - Controlled pilot	Time-bounded live use with defined scope, supervision, fallback, acceptance criteria and stop criteria.	ELNAV.AI participation approved - controlled pilot
C - Operational use	Output is relied upon in routine operations, procedures, alerts, control or decisions.	ELNAV.AI participation approved - operational use

An approval with conditions shall always identify the permitted stage, the conditions, the owner and the deadline. A project that does not meet the required gate shall be recorded as **Not ready - on hold**.

An individual check may be marked not applicable only with a documented rationale. An entire mandatory gate may not be marked not applicable. A conditional approval is permitted only where evidence necessary for safe commencement of the requested stage is complete and the open item is not a prohibition, hold condition, required approval, or material safety, human-authority, fallback, training, legal, privacy or workforce control.

5.2 Enhanced-risk flag

The enhanced-risk flag is not a deployment stage. It is an overlay requiring additional review, safeguards and approval. It may apply to an offline evaluation, pilot or operational deployment.

5.3 Proportionate evidence

The depth of evidence may be proportionate to risk and stage, but the core prohibitions and hold conditions in Section 7 apply at every stage. Live exposure, personal data, safety-critical interfaces and irreversible consequences require stronger evidence than offline technical exploration.

6. Mandatory deployment gates

No deployment may progress beyond the approved stage until the applicable gate evidence is recorded in the ELNAV.AI Deployment Readiness Record.

G0. Eligibility, roles and classification

ELNAV.AI shall:

- identify the system, version, configuration, project parties, vessel or work context and proposed stage;
- identify provider, deployer, employer, controller, processor, integration and operational responsibilities as applicable;
- screen for relevant law, flag-State, class, equipment, labour, privacy, cyber and Safety Management System requirements;
- determine whether an enhanced-risk configuration is proposed; and
- place the project on hold where a material legal, regulatory, approval or role question remains unresolved.

G1. Intended use, boundary and authority

Before live use, the project shall document:

- the safety or operational problem, intended users, permitted use, prohibited use and operating domain;
- system inputs, outputs, interfaces, dependencies, expected performance and known limitations;
- who receives each output, what action is expected and who retains decision and intervention authority;
- any claimed safety, workload, staffing, fuel, cost, schedule or productivity benefit and the assumptions on which it depends; and
- the boundary between the AI-enabled system, mandatory equipment, operator procedures and human judgement.

AI output shall not be configured or represented as displacing legally assigned responsibility. ELNAV.AI shall not market, configure or document the system as a basis for reduced safe manning, reduced watchkeeping, reduced rest, removal of a lookout or relaxation of competence requirements. Any proposed change to human responsibility, task allocation, manning, watchkeeping, lookout, rest or competence requirements requires a separate project-specific legal, technical, operational and human-factors assessment and all applicable approvals. Nothing in this clause permits ELNAV.AI participation prohibited by Section 7.2.

Where output is shared among the master, OOW, pilot, bridge team or shore roles, the project shall define the communication, acknowledgement and challenge process needed to maintain a common operational picture. Representative users shall demonstrate that they can question, reject and override output without procedural ambiguity or avoidable delay.

G2. Seafarer information, participation and feedback

Before affected seafarers are exposed to live use, ELNAV.AI shall obtain and review operator-owned documented evidence that:

- required information on purpose, functions, limits, data use, alerting, authority, fallback and reporting has been provided;
- representative users influenced task, interface, pilot or acceptance design before those decisions were fixed, where practicable;
- any absence of representative input has a recorded rationale, compensating evidence and deployment limitation;
- a practical route to report concerns, unexpected workload, nuisance alerts, unsafe pressure, data misuse, near misses and adverse effects is operational; and
- responsibility for reviewing and responding to feedback is assigned.

ELNAV.AI shall not treat silence, low reporting or a signed attendance sheet as proof of acceptance. The operator remains responsible for consultation and employment duties under applicable law and agreements.

Where the EU AI Act applies to the system as a high-risk AI system, the project shall separately record the applicable employer and deployer duties, including any required worker and workers' representative information. This Standard's seafarer-information and participation requirements apply regardless of whether that legal classification applies.

G3. Safety, task and workload assessment

The assessment shall cover normal, degraded, abnormal and emergency conditions and shall consider, as applicable:

- task allocation before and after deployment, including monitoring and verification work;
- attention demand, distraction, vigilance, out-of-the-loop risk and loss of manual skill;
- mode awareness, automation surprise, over-reliance and under-reliance;
- false positive, false negative, nuisance alert and alarm-flood consequences;
- handover, takeover, coordination and shore-to-ship effects;
- fatigue exposure, work and rest patterns, night work and cumulative workload;
- environmental conditions, ergonomics, language, noise, lighting and accessibility; and

- reasonably foreseeable misuse, workaround, disuse and pressure to continue.

Where monitoring or takeover is credited as a risk control, the assessment shall demonstrate that available staffing and duty patterns can support it during night, peak-workload and degraded conditions without displacing lookout, rest or another safety-critical task. Nominal rest-hour compliance alone is insufficient evidence.

The method and acceptance criteria shall be appropriate to the task. Eye tracking, interaction counts, self-report, rest-hour records or a single proxy shall not be treated as a complete measure of situational awareness, workload, fatigue or safety. Material residual risks shall have an owner, control, evidence requirement and review date.

G4. Human-machine interface and alerts

The system shall present information in a form that supports the user's task and does not obscure mandatory information or procedures. As applicable, the user shall be able to identify:

- whether the system is active, inactive, degraded, disconnected, updating or uncertain;
- what the system has detected or inferred and the action, if any, that is expected;
- relevant limitations, confidence or uncertainty where these affect safe interpretation; and
- the difference between a recommendation, a system alert, a mandatory alarm and an operator procedure.

Each alert shall have a documented safety or operational purpose, priority, trigger, expected timely response, acknowledgement behaviour and clearing condition. Information without a defined timely response shall be presented as status or advisory information unless a documented safety justification supports alert treatment. Alert design shall be tested for nuisance, repetition, flooding, masking, inappropriate escalation and workload under representative conditions.

During defined critical operating phases, the system shall defer or suppress non-essential prompts, administrative tasks and software updates. Safety-critical alerting shall remain available and appropriate to the current mode. Critical phases, exceptions and recovery behaviour shall be documented and tested.

ELNAV.AI shall not modify, suppress, substitute for or claim equivalence with mandatory bridge equipment or alarms, including BNWAS functions, without vessel-specific technical review and the approvals required by the operator, flag State, class or equipment regime.

G5. Data, privacy and non-surveillance

Before personal or potentially identifiable seafarer data are processed, the project shall document:

- purpose, necessity, data categories, sources, inference, location of processing and system recipients;
- controller, processor and access responsibilities as applicable;
- retention, deletion, security, export, onward use and incident arrangements;

- the information provided to affected seafarers and the route for questions or challenge; and
- whether a legal, data-protection, worker-impact or other formal assessment is required.

ELNAV.AI shall default to the least data-intensive feasible configuration and shall separate immediate safety support from later review or analytics. Personal data collected for a safety purpose shall not be repurposed without a new assessment, appropriate legal basis, clear notice and project approval.

The following are prohibited as ordinary functions of the AI-enabled system: persistent raw audio or video recording, retention or export; voice, facial or identity profiles; named individual scoring or ranking; biometric, health-related, emotion, psychological or fitness-for-duty inference; routine shore export of seafarer-linked data; and use connected to discipline, productivity, employment or performance evaluation. This clause does not purport to alter recording required by mandatory equipment or applicable law; any interface with such equipment requires separate assessment and approvals.

A proposed exception for a time-bounded, separately documented research or controlled-evaluation activity requires a specific necessity, proportionality, legal, privacy and worker-impact assessment, written limits on retention and access, and enhanced-risk approval. It shall not be represented as a normal product configuration or safety requirement.

ELNAV.AI shall not present behavioural, visual, audio or interaction cues as a medical or psychological diagnosis. It shall not support emotion inference as an ordinary workplace deployment. Under Article 5(1)(f) of the EU AI Act, workplace emotion inference is prohibited except for a medical or safety purpose; any claimed exception remains subject to separate legal, necessity, proportionality, data-protection and safeguards assessment.

G6. Performance, degraded conditions and fallback

For the requested stage, the project shall provide documented analysis and testing proportionate to the defined operating domain, users, equipment and environment. Evidence shall address, where relevant to the approved scope, detection or recommendation performance, false positives, false negatives, latency, uncertainty, subgroup effects, data quality and interface behaviour.

The project shall identify relevant failure and degraded conditions, including as applicable sensor obstruction, poor signal or input quality, integration fault, network loss, power loss, stale data, model uncertainty, unavailable support and software update failure. It shall test those whose consequences could materially affect the approved scope and document the rationale and controls for conditions not practically testable before the requested stage.

Fallback, override, deactivation and rollback shall be defined and tested. A takeover shall not be credited as a control unless the designated person can realistically detect the need, understand the state and act within the available time while performing other duties. Logs shall support technical diagnosis and system-oriented learning without creating unnecessary personal surveillance.

G7. Operational readiness, training and support

Before a controlled pilot or operational deployment, the project shall define:

- relevant Safety Management System, management-of-change, bridge, watch, maintenance and incident procedures;
- onboard and shore roles, escalation paths, technical support and decision authority;
- training and familiarisation for each affected role, including purpose, limits, modes, alerts, expected responses, override, fallback, data use and reporting; and
- competence or understanding checks proportionate to the consequences of misuse.

Training shall be completed before the person is expected to use or oversee the system. Training shall not be described as regulatory certification unless issued under the relevant approved scheme. A pilot shall not replace mandatory watchkeeping, lookout, bridge-team or emergency duties.

For safety-critical use or oversight, competence shall be demonstrated in representative normal, degraded, incorrect-output and takeover scenarios before access is granted. Attendance or self-declaration alone is insufficient. Where automation displaces a manual skill required for fallback, the project shall define recurrent practice and reassessment intervals.

G8. Acceptance, decision and post-deployment control

Before approval, the project shall define measurable acceptance criteria and stop criteria. Criteria shall include relevant safety, human-factors, workload, alert, data and operational measures, not only technical uptime, adoption or return on investment.

The decision record shall identify the system and version, evidence reviewed, unresolved conditions, permitted stage, restrictions, owner, review date and approvals. ELNAV.AI shall define an agreed review cadence and trigger events, and shall perform or support the review within its contracted role using evidence reasonably made available by the operator. The project participation terms shall require the operator to notify ELNAV.AI promptly of serious incidents, material near misses, unexpected workload effects, material data concerns, repeated nuisance alerts, repeated user workarounds or bypassing, other evidence that a control is ineffective, failures outside assumptions and material changes relevant to the approved configuration.

Continuation shall never be assumed because a trial period ended. The review shall explicitly decide to continue, modify, suspend, revert or exit.

7. Hold and no-go conditions

7.1 Automatic hold

ELNAV.AI shall record the project as **Not ready - on hold** where any of the following applies:

- intended use, operating domain, system boundary or human authority is materially unclear;
- a material safety, workload, fatigue, alert, privacy, surveillance, security or fallback question remains unanswered;
- a required operator, flag-State, class, equipment, labour, privacy or Safety Management System approval is absent;
- the operator refuses proportionate assessment, affected-seafarer information, required training, feedback routes or responsibility allocation;
- there is no practicable and tested means to deactivate, revert, recover or continue safely;
- representative evidence does not support the proposed stage or public claim;
- repeated false alerts, missed detections, mode confusion, integration failure or takeover difficulty remains materially unresolved; or
- there is no accountable owner and escalation path for operation, support, incidents and data.

7.2 Prohibited participation

ELNAV.AI shall not initiate, activate, configure, materially support or continue a deployment within its control where it knows that the deployment:

- depends for its claimed benefit on transferring unassessed safety risk or additional workload to seafarers;
- introduces undisclosed surveillance or covertly repurposes safety-support data;
- uses the system for routine disciplinary, productivity, identity, psychological, medical, fitness-for-duty or employment evaluation contrary to this Standard;
- uses emotion inference as an ordinary workplace function;
- presents AI output as a substitute for professional judgement, mandatory equipment or legal responsibility without an approved basis; or
- uses the project as the sole basis for reducing safe manning, watchkeeping, rest, lookout or competence requirements.

Commercial urgency, sunk cost, customer pressure or seniority shall not override a hold or prohibited-participation decision. No waiver may authorise an activity prohibited by this Section.

7.3 Resolution or withdrawal

A hold may be closed only by documented evidence reviewed through the applicable gates. If a material hold cannot be closed, ELNAV.AI shall decline the affected scope or suspend its activation, configuration, update and support activities to the extent permitted by contract, safety obligations and applicable law. ELNAV.AI shall not represent that it can control an operator's independent use beyond those levers.

8. Responsibilities

8.1 ELNAV.AI responsibilities

Within its role and control, ELNAV.AI shall:

- document intended use, prohibited use, configuration, version, system boundary, performance evidence and known limitations;
- disclose relevant dependencies, data flows, failure modes, update effects and support arrangements;
- provide project-appropriate training material, instructions and reporting routes;
- maintain evidence, decisions, conditions, change records and known-issue communications;
- distinguish product capability, pilot evidence, research and roadmap claims; and
- exercise the hold, suspension and withdrawal duties in this Standard.

8.2 Operator responsibilities to be confirmed

Before ELNAV.AI materially supports a live stage, it shall identify and obtain documented confirmation of the operator responsibilities that remain within the operator's control, including:

- applicable law, flag-State and class obligations, equipment approval and Safety Management System integration;
- safe manning, work and rest, watchkeeping, lookout, onboard procedures and operational decisions;
- worker and representative information or consultation, employment decisions and collective-agreement duties;
- lawful basis, privacy notice, controller duties, access control, retention and local data governance;
- completion of required training and familiarisation; and
- vessel-specific risk assessment, incident response and emergency command.

ELNAV.AI shall not imply that use of its system transfers these duties to ELNAV.AI.

8.3 Shared project responsibilities

ELNAV.AI shall require documented allocation between the project parties of ownership of the pilot plan, vessel-specific assessment, acceptance criteria, stop criteria, configuration control, support, reporting, post-deployment review and exit plan. Unallocated responsibility is a hold condition.

9. Evidence, decisions and change control

9.1 Deployment Readiness Record

Each in-scope deployment-related project shall maintain an ELNAV.AI Deployment Readiness Record before it enters a live evaluation, controlled pilot, operational deployment or material change. Early research, product development and offline technical evaluation shall maintain proportionate design and data-governance records; they need not use the full Deployment Readiness Record unless they involve live work, identifiable seafarer data, operational interfaces or an enhanced-risk configuration. Evidence may be referenced rather than duplicated, but references shall identify the document, version, owner and location. A blank field, assertion or verbal assurance is not evidence.

9.2 Decision states

The permitted decision states are:

1. ELNAV.AI participation approved - offline evaluation;
2. ELNAV.AI participation approved - controlled pilot;
3. ELNAV.AI participation approved - operational use; or
4. Not ready - on hold.

An approval may include conditions, but it shall still identify one of the first three stages. Conditions shall have an owner, due date and closure evidence.

A conditional approval shall not carry an unresolved precondition for safe commencement. Any open prohibition, hold condition, required approval, or material safety, human-authority, fallback, training, legal, privacy or workforce control requires the decision **Not ready - on hold**.

9.3 Approval functions and independence

A controlled-pilot or operational-use decision shall include two documented approval functions: technical accountability and competent maritime operational or safety challenge. A purely commercial rationale shall never be the sole basis for approval. Where one individual holds more than one role, the record shall identify the role conflict and the additional independent challenge used for the decision.

An enhanced-risk configuration additionally requires approval by the Chief Executive Officer and documented review by a person with appropriate legal and/or data-protection competence, as applicable to the configuration. The reviewer may be internal or external, provided that competence, role and any conflict of interest are documented. Where applicable law, contract, regulatory expectation

or the absence of suitable internal competence requires external professional advice, the project shall remain on hold until that advice is obtained.

9.4 Change control

The project shall screen every proposed change for materiality. Changes to intended use, users, operating domain, model or software version, sensors, input data, interface, alerts, integration, authority, data access, retention, export, fallback, operational procedure or claim shall reopen the affected gates before release.

Emergency technical action may be taken to place a system in a safer state. It shall be documented and reviewed before normal use resumes.

9.5 Suspension and learning

ELNAV.AI shall maintain a practical route to suspend its support, recommend deactivation or revert configuration where continued use may create material risk. Reviews shall preserve necessary evidence while avoiding blame-based conclusions and unnecessary exposure of personal data.

10. Governance and review

10.1 Standard owner and approval

The Chief Executive Officer is the owner of this Standard. Version 1.0 was adopted by the Director under ELNAV-DEC-AI-001 on 22 August 2026 and takes effect on that date. Adoption, amendment, suspension and withdrawal shall be recorded in document control. An amendment that materially changes scope, prohibitions, deployment gates or approval authority requires a new approved version.

10.2 Review triggers

This Standard shall be reviewed no later than 22 August 2027, at least annually thereafter, and sooner following:

- a serious incident or material near miss involving an in-scope system;
- a material regulatory, flag-State, class, labour or data-protection change;
- introduction of a materially different system category or enhanced-risk configuration;
- evidence that a requirement is ineffective, impracticable or being bypassed; or
- significant feedback from seafarers, operators, reviewers or other affected stakeholders.

10.3 Public representation

ELNAV.AI may publish this Standard and state that it governs ELNAV.AI's participation once approved. Third-party use, reference or self-assessment does not constitute ELNAV.AI certification, endorsement or approval. Public claims shall identify the document version and shall not imply broader regulatory status.

Reference basis

This Standard is informed by the following sources. They are not incorporated as external certification criteria, and the list is non-exhaustive. Each source shall be interpreted within its own scope and limitations. Citation of a treaty, regulation, resolution, circular or standard does not state or imply that ELNAV.AI, a system, vessel, operator or deployment conforms to it. Applicability, legal effect, approval and compliance must be determined for the specific vessel, flag, product, role and use case.

1. European Maritime Safety Agency, *Safety Analysis of EMCIP Data: Analysis of Navigation Accidents*, V1.0, September 2022.
2. International Maritime Organization, *E-navigation*, including the link to MSC.1/Circ.1512, *Guideline on Software Quality Assurance and Human-Centred Design for E-navigation*. [IMO source](#)
3. International Maritime Organization, *The International Safety Management (ISM) Code*. [IMO source](#)
4. International Maritime Organization, *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW)*, including regulation I/14, section A-I/14 and tables A-II/1 and A-II/2. Part A of the STCW Code is mandatory; requirements apply through Parties and applicable national implementation. [IMO source](#)
5. International Labour Organization, *Maritime Labour Convention, 2006, as amended (MLC, 2006)*, Regulation 4.3 and Standard A4.3 on health and safety protection and accident prevention. [ILO NORMLEX source](#)
6. International Maritime Organization, *SOLAS chapter V, regulation 15* and SN.1/Circ.265, *Guidelines on the Application of SOLAS Regulation V/15 to INS, IBS and Bridge Design*; SN.1/Circ.288, *Guidelines for Bridge Equipment and Systems, Their Arrangement and Integration*; MSC.302(87), *Performance Standards for Bridge Alert Management*; and MSC.1/Circ.1609, *Guidelines for the Standardization of User Interface Design for Navigation Equipment*. [IMO source](#)
7. International Electrotechnical Commission, *IEC 62288:2021/AMD1:2024, Presentation of Navigation-Related Information on Shipborne Navigational Displays*. [IEC catalogue entry](#)
8. International Maritime Organization, resolution MSC.595(111), *International Code of Safety for Maritime Autonomous Surface Ships (MASS Code)*, non-mandatory, adopted May 2026 and effective 1 July 2026; applicable to cargo ships. Used only as forward-looking context, not as a compliance route for this Standard or a conventional bridge-assistance system. [IMO source](#)
9. European Union, Regulation (EU) 2024/1689 (Artificial Intelligence Act), as amended; consolidated text consulted dated 27 July 2026. [EUR-Lex source](#)

10. European Union, Regulation (EU) 2016/679 (General Data Protection Regulation). [EUR-Lex source](#)
11. International Transport Workers' Federation, *Technology & Decent Work Charter 2024*, January 2024.
12. Maritime Just Transition Task Force, *Mapping a Maritime Just Transition for Seafarers*, position paper, November 2022.
13. MARIN, *Track Pilot-Automation: Determining Best Practices for Implementation on Board Inland Vessels*, Report 35007-1-MO-rev.1, 20 December 2023.
14. J. M. Mol et al., *Measuring Situational Awareness Onboard and Ashore Under Increasing Trackpilot Information Load*, Journal of Physics: Conference Series 3123 (2025) 012058. [DOI](#)
15. M. L. Bransby and J. Jenkinson, *The Management of Alarm Systems*, UK Health and Safety Executive, 1997. This is cross-industry guidance and is used only for transferable alarm-management practices.
16. F. Crestelo Moreno et al., *Fatigue as a Latent Risk Factor in Maritime Safety Systems: A Systematic Review and Implications for Reliability Analysis*, Reliability Engineering & System Safety 267 (2026) 111930. [DOI](#)
17. DNV and Equinor, *CLUE - Contextual Learning & Understanding of Events*, 2026.
18. Human Element Industry Group, *Guidelines for the Management of Distraction-Causing Devices on Board Ships*, especially the risk-management and SMS guidance on pp. 7-18.

Appendix A. Evidence-to-gate map

This map identifies the strongest sources informing each gate. It is an audit aid, not a statement that the source requires every ELNAV.AI clause. Page references refer to the supplied PDF files where applicable.

Gate	Main evidence theme	Principal reference basis
G0	Roles, regulatory screening, system boundary and risk governance	IMO ISM Code; EU AI Act Articles 4-6 and Annex III; GDPR; IMO MASS Code as forward-looking context only
G1	Intended use, bridge authority, common operational picture and challenge	IMO e-navigation and MSC.1/Circ.1512; SOLAS V/15 guidance; EMSA navigation analysis pp. 38 and 42
G2	Early user input, worker information, consultation, feedback and redress	ITF Technology & Decent Work Charter pp. 4-10; Maritime Just Transition paper; EU AI Act Article 26 where applicable; HSE alarm report p. 38 PDF / p. 26 report
G3	Workload, fatigue, attention, task allocation, authority and takeover	EMSA navigation analysis p. 57; MARIN Track Pilot-Automation; Fatigue review pp. 12-14; HEIG distraction guidance pp. 7-18
G4	Human-machine interface, alert purpose, nuisance and critical-phase distraction	IMO MSC.302(87), MSC.1/Circ.1609 and IEC 62288; EMSA pp. 58-59; HSE alarm report pp. 29-35 and 53-56 PDF
G5	Purpose limitation, data minimisation, worker data and prohibited or enhanced-risk uses	GDPR Articles 5, 25 and 35; EU AI Act Article 5 and Annex III(4)(b); ITF Technology & Decent Work Charter
G6	Representative performance evidence, degraded modes, takeover and rollback	MARIN Track Pilot-Automation pp. 13, 24-28 and 36-37 PDF; IMO e-navigation reliability, resilience and integrity principles
G7	Familiarisation, scenario-based competence, fallback and manual-skill retention	STCW regulation I/14 and section A-I/14; MARIN pp. 38-40 PDF; EMSA p. 45
G8	Acceptance metrics, event learning, review, suspension and controlled change	IMO ISM Code; HSE alarm-management measures; DNV/Equinor CLUE; EU AI Act post-market principles where applicable

Approval record

Role	Name	Decision	Date
Standard owner	Hrvoje Mihovilović, Chief Executive Officer	Approved	22 August 2026
Maritime operational review	Hrvoje Mihovilović, Master Unlimited	Reviewed	22 August 2026
Adoption authority	Hrvoje Mihovilović, Director	Adopted under ELNAV-DEC-AI-001	22 August 2026

This approval record concerns adoption of the Standard and is separate from the project approval functions required by Section 9.3.

End of ELNAV-STD-AI-001, Version 1.0