

AI Agents for Maritime & Offshore Projects

Automating the Document-Intensive Workflows That Define Project Execution

Supplier Qualification · OQE & Certification · QA/QC Inspection · FAT Coordination · Final Documentation

```
python download_model.py
```

● llama.cpp is now successfully compiled and installed. Here's a summary:

Build Summary

Component	Status
CPU backend	✓ ARM with NEON (mcpu=native)
CUDA backend	✓ NVIDIA GB10 (compute 12.1)
Main binary	llama-cli
Server	llama-server
Tools	20+ utilities compiled

Key Binaries Available in ~/workspace/ai-llm/llama.cpp/build/bin/

- llama-cli - Main CLI for running models
- llama-server - HTTP server for API access
- llama-bench - Benchmark tool
- llama-quantize - Model quantization
- llama-embedding - Generate embeddings

SERVICE AI Agent Automation	DELIVERY 7-Day Implementation	SECTORS Maritime, Offshore, Oil & Gas	FOCUS QA/QC, OQE, FAT, Documentation
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OVERVIEW

Eliminating the Document Burden in Offshore Project Execution

Maritime and offshore projects are defined not only by the steel they produce, but by the volume of documentation that must accompany it. Every supplier, every certificate, every weld, every test, and every handover package generates records that must be created, reviewed, cross-referenced, and archived to satisfy classification societies, client quality systems, and regulatory authorities.

Ingeniat's AI agent practice has developed a suite of purpose-built agents for the five workflows that consume the most engineering and project management time in offshore fabrication and procurement: supplier qualification and onboarding, material certification and OQE traceability, production and welding QA/QC inspection, functional testing and FAT coordination, and final documentation and handover reporting. Each agent is configured to the client's own procedures, document formats, and governing standards.

THE BUSINESS CASE

Why Document-Intensive Workflows Are the Critical Bottleneck

In offshore projects, quality and documentation disciplines account for a disproportionate share of project hours relative to the value they add at any individual step. An inspector who spends half their day formatting NCR reports, chasing missing certificates, or compiling FAT punch lists is not deploying the expertise for which they were engaged. A project engineer building a handover dossier from scratch in the final weeks of a project is a symptom of a systemic failure to capture information at source throughout execution.

The consequences are measurable. Documentation deficiencies discovered at handover trigger costly rework, delay project close-out, and expose contractors to contractual penalties. Classification society comments on incomplete OQE packages stall certificate issue. Supplier approval bottlenecks slow procurement mobilisation. These are not exceptional events — they are the default outcome of manual, unstructured document workflows.

40–60%

of QA/QC time spent on documentation, not inspection

3–6 wks

typical handover dossier compilation delay at project close

7 Days

to first working agent deployment

400+ hrs

recoverable project engineering time (80-vendor programme)

“Documentation deficiencies at handover are not exceptional events — they are the default outcome of manual, unstructured quality workflows throughout execution.”

Ingeniat Project Engineering Practice

Automating the Approved Vendor List Workflow

Qualifying a new supplier for an offshore project involves collecting, reviewing, and scoring a structured set of information: company registration and financial standing, quality management system certification (ISO 9001, EN 3834, etc.), relevant experience and references, HSE performance record, and technical capability documentation. The process is largely identical for every vendor, yet it is typically executed manually each time by project procurement or quality teams.

The Supplier Qualification Agent automates the intake, review, and preliminary scoring of vendor qualification submissions. When a supplier submits a Pre-Qualification Questionnaire (PQQ) or capability pack, the agent extracts the key data fields, checks for completeness against the project-specific Approved Vendor List (AVL) criteria, cross-references certificate expiry dates, and generates a structured evaluation summary ready for engineer review and approval. Incomplete submissions trigger an automatic request for the missing items, with a tracked follow-up sequence.

What the Agent Does:

- ✓ **PQQ intake & parsing:** Reads PDF and web-form submissions; extracts key fields automatically
- ✓ **Completeness check:** Validates submission against project AVL criteria; flags missing items
- ✓ **Certificate tracking:** Reads ISO, EN, and ASME cert expiry dates; flags items expiring within project window
- ✓ **Scoring summary:** Generates structured evaluation sheet for engineer sign-off
- ✓ **Gap request letters:** Drafts and sends missing-information requests with deadline and follow-up
- ✓ **AVL register update:** Populates approved vendor register with verified data on approval

Typical time saving: 3–5 hours per vendor qualification.
For a project onboarding 40–80 vendors, this represents 120–400 hours of recoverable engineering time.

Closing the Objective Quality Evidence Loop

Objective Quality Evidence (OQE) is the documentary backbone of any offshore fabrication project subject to classification society oversight. Every item of material — plates, pipes, fittings, forgings, castings, fasteners — must be accompanied by a mill certificate, heat number, and material test report (MTR) that can be traced from the original order through to the as-installed position in the structure or system. In practice, managing this chain across hundreds or thousands of line items is one of the most labour-intensive tasks in project quality management.

The OQE & Certification Agent monitors the material certification register throughout fabrication. When a delivery arrives and certificates are scanned or uploaded, the agent reads the document, extracts the heat number, material grade, certificate type, and test results, and matches these against the purchase order and material specification requirements. Deviations — wrong grade, missing impact test data, heat number mismatch, non-conforming chemical composition — are flagged immediately as non-conformances with a structured NCR pre-draft ready for QA engineer review.

SERVICE AREA	DELIVERABLES & CAPABILITIES
Certificate intake	Reads MTRs, EN 10204 3.1 and 3.2 certificates, and test reports from scanned PDFs or uploaded files. Extracts heat number, grade, heat treatment, dimensional data, and mechanical and chemical test results.
Specification matching	Cross-references extracted certificate data against the line item material specification and purchase order requirements. Flags any deviation from specified grade, standard, or test requirement.
Heat number traceability	Maintains a live heat-number-to-drawing-position register. Links each material item to its installed location for the final OQE dossier and class submission.
Expiry and retest monitoring	Tracks consumable certification expiry (welding consumables, NDT equipment calibration, operator qualification validity) and issues advance warnings before expiry during active production.
NCR pre-drafting	For identified deviations, generates a structured Non-Conformance Report draft including the affected items, deviation description, reference requirement, and proposed disposition options for QA engineer review.
OQE dossier assembly	On completion, compiles the full OQE package in client or classification society format: index, certificates sorted by system or tag, heat number register, and deviation disposition record.

From Inspection Record to Quality Register, Automatically

Production inspection in offshore fabrication generates a continuous stream of records: fit-up and dimensional checks, weld visual inspection reports, NDT requests and results, PWHT charts, coating inspection records, and non-conformance reports. Each document must be reviewed, accepted or rejected, filed against the correct drawing and weld number, and ultimately compiled into the quality dossier. The volume is high; the tolerance for error is zero.

The Production & Welding Inspection Agent operates as a real-time back-office for the site QA/QC team. Inspection records submitted by inspectors — via mobile form, scanned upload, or structured data entry — are processed immediately: data is extracted, welder and procedure qualifications are verified against the applicable WPS/PQR register, acceptance criteria are applied, and the result is posted to the live weld and inspection register. Overdue inspections are flagged. NDT rejection rates are tracked by welder, procedure, and position for trending analysis.

Inspection Record Processing:

- ✓ **Fit-up & dimensional checks:** Reads mobile form data; posts pass/fail to weld register with dimensional record
- ✓ **Weld visual inspection:** Extracts welder ID, WPS reference, joint ID; verifies WPS applicability; logs result
- ✓ **NDT request & result:** Generates NDT request from weld register; logs RT/UT/MT/PT results; flags rejects
- ✓ **PWHT chart review:** Reads time-temperature chart data; verifies against procedure requirements; archives
- ✓ **Coating inspection:** Processes SSPC/NACE inspection records; logs DFT readings and holiday test results
- ✓ **NCR management:** Pre-drafts NCRs for rejections; tracks open items; issues close-out reminders

Quality Analytics:

- ✓ **Welder performance tracking:** Rejection rate by welder, position, and process — triggers retest review threshold alerts
- ✓ **NDT trending:** Defect type and location analysis for production quality feedback
- ✓ **Inspection backlog monitoring:** Flags pending inspections approaching hold-point deadlines

Coordinating and Documenting the FAT Programme

A Factory Acceptance Test for a complex offshore package — a chemical injection skid, a control panel, a high-pressure pump set — involves preparing a structured test procedure, coordinating witness attendance from the client and classification surveyor, executing the test sequence with recorded results against acceptance criteria, logging punch list items, and producing a signed test certificate and punch list register. Managing this across multiple packages and suppliers simultaneously is a significant project coordination burden.

The FAT Coordination Agent manages the full FAT programme workflow. It generates test procedures from the equipment data sheet and contractual test requirements, issues witness notifications with the required advance notice period, and provides a live test status dashboard. During the test, it processes inspector-submitted result entries in real time, applies acceptance criteria, and flags any out-of-tolerance results immediately. On completion, it compiles the FAT dossier — procedure, results, punch list, and signed certificate — ready for distribution.

- ✓ **Test procedure generation:** Produces FAT procedure from data sheet and specification; formats to client or class template
- ✓ **Witness coordination:** Issues notifications to client, class, and third-party inspectors with required notice periods
- ✓ **Live result capture:** Processes inspector-entered test results in real time; applies pass/fail criteria automatically
- ✓ **Punch list management:** Logs outstanding items with category (A/B/C); tracks close-out; issues reminders
- ✓ **Pre-shipment check:** Verifies all Cat A punch items closed and all documents signed before release for shipment
- ✓ **FAT dossier compilation:** Assembles complete test package: procedure, results record, punch list, and certificate

Compiling the Handover Dossier Without the Final-Week Scramble

The project handover dossier — also referred to as the Final Documentation Package, the Mechanical Completion Dossier, or the As-Built Package — is the end-product of every quality and engineering activity conducted during execution. In practice, it is frequently assembled under time pressure at project close, relying on incomplete records, inconsistent filing, and manual compilation by engineers who should have demobilised weeks earlier.

The Final Documentation Agent runs continuously throughout the project, not only at close-out. It monitors the document register, checks that each required document has been received and accepted for every scope item, and maintains a live completeness index. When a document is accepted — a test record, a certificate, an as-built drawing revision — it is automatically assigned to the correct section of the handover dossier structure.

At project close, the agent generates the complete handover package: indexed, paginated, and formatted to the client's specified structure or the applicable class society requirements. Outstanding items are presented as a structured punch list with responsible party and required action, not discovered for the first time during the final review.

- ✓ **Document register monitoring:** Tracks required vs received documents for every scope item throughout execution
- ✓ **Auto-filing:** Assigns accepted documents to the correct handover dossier section on receipt
- ✓ **Completeness dashboard:** Live index showing dossier completion percentage by section and system
- ✓ **Dossier compilation:** Generates indexed, paginated final package in client or class format on demand
- ✓ **Close-out punch list:** Structured list of outstanding items with responsible party and required action

DELIVERY & INVESTMENT

Implementation Model — From Brief to Working Agent in 7 Days

Each agent is configured to the client's own procedures, document templates, governing standards, and quality management system. Ingeniat's implementation process begins with a scoping session to map the target workflow, identify input sources and output destinations, and define the acceptance criteria and human-in-the-loop review gates. The working agent is delivered within seven days of brief sign-off.

Starter Package

- ✓ **Single agent, fully configured:** Built for your specific workflow, templates, and standards
- ✓ **Knowledge base setup:** Trained on your procedures, forms, and document formats
- ✓ **Channel integration:** Connects to email, Slack, Telegram, or shared drive as required
- ✓ **7-day delivery:** Working agent within one week of brief sign-off
- ✓ **30-day support window:** Post-deployment support included
- ✓ **60-minute training session:** Handover and team familiarisation

Ongoing Support

Optional — cancel anytime. Agent operates without it.

- ✓ **Technical support:** Questions, troubleshooting, fault resolution
- ✓ **Configuration updates:** Procedure or template changes propagated to agent
- ✓ **Optimisation recommendations:** Proactive suggestions as workflow evolves

The five agents described in this document can be deployed independently or as an integrated programme across the full project quality lifecycle. A full programme deployment — all five agents configured and integrated — is scoped individually based on project complexity and existing QMS infrastructure.

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Discuss Your Project

Book a 30-minute scoping call to identify the highest-value automation opportunity in your current project workflow. We will map the target process and deliver a working agent prototype within seven days.

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 Book a call: cal.com/ingeniat-es

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Estudios y Proyectos SL

Engineering & Digitalization

- AI Agents — Maritime & Offshore
- Supplier Qualification Agent
- OQE & Certification Agent
- Production Inspection Agent
- FAT Coordination Agent
- Final Documentation Agent

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