

Engineering AI Assistant

Rigid Jumper & Pipeline Teams

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Author: ACE Engineer

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Engineering AI Assistant

Rigid Jumper & Pipeline Teams

Powered by large language model technology with deep offshore engineering context

Page 1 — What It Does

Engineering Areas Covered

Rigid Jumper & Spool Design

- Wall thickness sizing — ASME B31.8 / API 2RD pressure containment
- Combined stress checks — Von Mises (pressure + bending + thermal)
- Fatigue screening — DNV-RP-C203 S-N curves, SCF lookup, Miner's rule
- VIV susceptibility — reduced velocity check, lock-in range, DNV-RP-F105
- OrcaFlex model setup — element types, boundary conditions, time step guidance
- OrcaFlex output processing — ASCII result extraction, envelope tables, load case summaries

Subsea Pipeline Engineering

- Wall thickness design — DNV-OS-F101 (pressure + collapse + propagation buckling)
- On-bottom stability screening — DNV-RP-F109 absolute lateral stability
- Free span assessment — DNV-RP-F105 allowable span length vs pipe size
- Installation method selection — S-lay / J-lay / reel comparison by water depth + OD
- Corrosion management — NACE MR0175 sour service, internal/external CA logic

Fitness for Service (API 579-1 / ASME FFS-1)

- **Wall loss** — Part 4/5 Level 1/2: RSF screening, remaining strength factor
- **Corroded pipeline** — ASME B31G / modified B31G (RSTRENG), MAOP de-rating
- **Dents** — Part 12: $d/D \leq 6\%$ plain, $d/D \leq 2\%$ on weld; gouge interaction
- **Remaining life** — corrosion growth projection, re-inspection interval

Gulf of Alaska (GoA) Specifics

- GoA vs GoM design criteria — wave heights, seismic loading, ice constraints
- BSEE GoA data — lease activity, environmental permits, regulatory requirements
- Seismic design — API RP 2EQ spectral approach for GoA platforms
- Extreme metocean — 100-yr parameters for GoA (typically harsher than GoM)

Sample Conversations

QUESTION	TIME: MANUAL	TIME: AI
"What's the wall thickness for 12" X65 at 5,000 ft WD, 3,000 psi?"	30–60 min	< 2 min
"Assess FFS for 15% wall loss in a GoM rigid jumper"	2–4 hr	15 min
"Draft calculation memo for rigid jumper strength check"	4–8 hr	1–2 hr
"What's the GoA 100-yr Hs and how does it compare to GoM?"	1–2 hr	2 min
"Extract max tension and curvature from OrcaFlex ASCII results"	1–2 hr/case	5 min

Page 2 — Roadmap & Next Steps

Phased Deployment

PHASE 1 – Desktop Q&A Demo	Week 1
Live demo: code lookups · calculations · OrcaFlex processing	
Cost: \$0 additional · uses existing AI subscriptions	
PHASE 2 – Microsoft Teams Chatbot	Weeks 2-4
Bot in your existing Teams channels · always-on assistant	
Discipline-specific context loaded · conversation threading	
Cost: ~\$20–200/month · Azure Bot Service + Claude API	
PHASE 3 – Document Intelligence	Months 2-3
Connect to project docs: design basis · metocean reports	
"What riser OD did we evaluate for this site?" → instant	
Cost: ~\$500–2,000/month · RAG backend + document index	
PHASE 4 – Engineering Review QC	Months 4-6
Automated checks: analysis vs. design basis alignment	
Flag inconsistencies · compliance check vs. applicable codes	
Grows smarter with every project	

Gets Smarter Over Time

Unlike a generic AI tool, this assistant is discipline-specific from day one — and compounds in value with every engagement:

- **Phase 1 → 2:** Each demo question that stretches the system becomes the next knowledge update; the assistant improves after every session
- **Phase 2 → 3:** Once your project documents are indexed, answers are grounded in *your* design history — not just published standards
- **Phase 3 → 4:** Repeated use encodes your team's preferred methods, project terminology, and lessons learned — institutional knowledge that persists across staff changes
- The longer it runs, the more precise it becomes: "*What wall thickness did we use on the last GoA rigid jumper?*" becomes instantly answerable

What the AI Does Not Do

- Does not replace the reviewing engineer. Engineering judgment is still required.

- Does not execute OrcaFlex or other engineering software directly
- All outputs carry a disclaimer: *preliminary/informational, requires engineer verification*
- No proprietary project data stored or used without explicit setup

Expected Returns

METRIC	CURRENT	WITH AI	SAVING
Code reference lookup	15–30 min	1–2 min	90%
Preliminary sizing	2–4 hr	15–30 min	85%
Calculation memo draft	4–8 hr	1–2 hr	75%
Simulation data extraction	1–2 hr/case	5–10 min	90%
Scope of work drafting	1–2 days	2–4 hr	70%

Pilot Proposal

1. **Week 1** — Live demo (30 min per team) with 3–5 real project questions
2. **Week 2–3** — Pilot with 2–3 engineers using actual project work
3. **Week 4** — ROI review · decision on Teams chatbot deployment
4. **Month 2+** — Full team rollout · document intelligence integration

Engineering judgment encoded into a system that scales. Domain expertise — not generic AI — is the differentiator.