Engineering AI Assistant

Rigid Jumper & Pipeline Teams

Date: February 2026

Author: ACE Engineer

Confidential

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Rigid Jumper & Pipeline Teams

Powered by large language model technology with deep offshore engineering context

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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 ≤ 6% plain, d/D ≤ 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

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│  PHASE 1 — Desktop Q&A Demo          Week 1                  │
│  Live demo: code lookups · calculations · OrcaFlex processing │
│  Cost: $0 additional · uses existing AI subscriptions        │
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│  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                            │
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What the AI Does Not Do

- Does not replace the reviewing engineer — augments and accelerates
- 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

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