



Market Survey for the Acquisition of a New Floating Crane (RFI)

1. Background

The Panama Canal Authority (ACP), an autonomous entity of the Republic of Panama responsible for the administration, operation, and modernization of the Panama Canal, is currently evaluating the potential acquisition of one (1) new floating crane as part of its operational planning activities and institutional capacity strengthening.

In connection with this potential need, and as a preliminary step prior to any possible public procurement process, ACP has determined it appropriate to conduct a market survey to collect reference technical and commercial information available in the international market.

2. Objective of the Request for Information

The objective of this Request for Information (RFI) is to collect general, indicative, and non-binding information that will allow ACP to:

- gain an understanding of customary market practices applicable to floating crane projects of comparable scope and complexity;
- assess commercial and contractual structures commonly used, including payment mechanisms, delivery timelines, and payment protection instruments;
- identify typical technical approaches, design criteria, and market-adopted solutions; and
- obtain inputs to support the preparation of a potential future Request for Proposals (RFP), should ACP decide to proceed with a procurement process.

3. Scope and Nature of the RFI

This Request for Information:

- is issued strictly for informational purposes;
- is conducted exclusively for market survey, benchmarking, and planning activities;
- is voluntary and non-binding for respondents; and
- does not constitute, nor shall it be construed as:
 - an offer,
 - a request for an offer,
 - an invitation or commitment to negotiate, or
 - any representation, obligation, or commitment on the part of ACP.

Responses may be submitted partially and at a conceptual or high-level, based on prior experience or customary market practices. Detailed engineering information, firm pricing, or contractual positions are not required at this stage.

4. Procurement Outlook

Subject to the corresponding internal approvals, ACP anticipates the possibility of initiating a public procurement process prior to the end of 2026 for the acquisition of the floating crane.

Participation or non-participation in this RFI does not confer any advantage or disadvantage in any subsequent procurement process, nor does it constitute a prerequisite for participation therein.

5. Intended Respondents

ACP invites participation in this RFI from:

- shipyards,
- crane manufacturers,
- engineering firms,
- system integrators, and
- other market participants with demonstrated experience in the design, construction, and supply of floating cranes or comparable marine lifting equipment.

6. Use of Information and Confidentiality

All information received will be used exclusively for internal ACP purposes, within the context of market analysis and procurement planning activities, in accordance with applicable institutional policies and regulations.

7. Regulatory Framework

This Request for Information is issued in accordance with the Panama Canal Authority Contract Regulations, which are publicly available at the institutional website:

www.pancanal.com

8. Final Statement

The Panama Canal Authority appreciates the market's interest and collaboration in this information-gathering exercise, which aims to support the development of a future procurement process that is technically sound, commercially realistic, and aligned with international market practices.

QUESTIONNAIRE

General Guidance to Respondents

Responses may be provided on a high-level, indicative, and non-binding basis, drawing on prior experience with comparable projects.

Partial responses are acceptable. Detailed engineering, pricing, or contractual positions are not required.

SECTION 1 – CONTRACTING TERMS

Indicative Commercial and Contractual Market Practices

Purpose

The purpose of this section is to collect high-level information on customary market practices related to commercial, contractual, and delivery arrangements typically applied to newbuild floating cranes of comparable scope and complexity.

Responses are requested for planning and benchmarking purposes only.

Questions

1.1 Proposal Preparation Period

Based on your market experience, please indicate the typical proposal preparation period customarily allowed or required following the issuance of an RFP for a newbuild floating crane of similar scope and complexity.

Please provide an indicative range expressed in weeks or calendar days.

1.2 Indicative Delivery Lead Time

Considering current market conditions, typical shipyard capacity, and order backlog assumptions, please indicate the customary lead times for delivery of a newbuild floating crane of this type.

For planning purposes, please express the lead time as an indicative range, measured from contract award or notice to proceed through delivery and final acceptance.

1.3 Indicative Milestone-Based Payment Structure

ACP typically operates under Net 30 payment terms. For this project, ACP is evaluating the potential use of a milestone-based payment structure.

For market feedback purposes only, an illustrative Payment Prorating Schedule is provided below.

Please indicate whether a substantially similar milestone-based payment structure is generally consistent with market practice and provide any high-level observations or considerations based on your experience.

High-level observations are sufficient; detailed contractual positions are not required. This RFI does not constitute a commitment to any specific payment terms.

Illustrative Payment Prorating Schedule (For Market Feedback Only)

No.	Milestone Description	%
1	Evidence of reservation of fabrication slots and procurement of major long-lead components	15%
2	Hull steel delivery, design submissions, keel laying, and procurement of major machinery	15%
3	50% hull and superstructure construction; installation of main generator sets	15%
4	Completion of factory testing of crane and receipt at building yard	15%
5	Launching, 100% construction and successful trials at building yard	20%
6	Delivery in Panama (Balboa or Cristobal)	10%
7	Final inspection, training, documentation, and final acceptance in Panama	10%
Total		100%

1.4 Technical Data and Documentation Rights

Please summarize typical market practices regarding ownership, access rights, and permitted use of technical data and documentation, including as-built drawings, manuals, and technical specifications.

Where applicable, please also describe customary practices related to software and automation deliverables, including:

- licensing arrangements,
- use restrictions, and
- owner/operator access rights for operation, maintenance, and troubleshooting.

SECTION 2 – PAYMENT STRUCTURE AND FINANCIAL SECURITIES

Typical Market Approaches for Milestone Payments and Owner Protection

Purpose

This section seeks to understand prevailing market practices regarding milestone-based

or progress payment structures and the types of financial securities commonly offered to protect owner payments prior to final delivery.

Questions

2.1 Currency of Proposal Submission

From a market practice perspective, please indicate whether pricing and submission of proposals in U.S. dollars is customary for contracts of this nature.

If so, please indicate whether your organization would generally be able to comply with this approach.

2.2 Payment Guarantees and Financial Securities

For market survey purposes only, and from the perspective of the owner/client, please describe the types of guarantees or financial securities commonly offered by shipyards to protect milestone or progress payments, including:

- typical forms of guarantees (e.g., advance payment guarantees, performance guarantees (e.g. Performance bonds),
- indicative coverage levels or ranges,
- customary reduction or amortization mechanisms as milestones are achieved, and
- conditions under which such guarantees are released or expire.

This question is intended solely to understand customary market practices and available options.

It does not constitute a request for commitment or establish any contractual requirement.

2.3 Factors Influencing Participation in Competitive Tenders

From a market perspective, please identify the key factors that most influence a shipyard's decision to participate in a competitive tender for a newbuild floating crane of this type, including, as applicable:

- schedule realism,
- allocation of technical and commercial risks,
- warranty and long-term support requirements,
- payment terms and security structure,
- testing and trial requirements, and
- logistics, transportation, and delivery conditions.

2.4 General Observations on ACP Contracting Framework

The ACP Contract Regulations are publicly available at [We Buy - Autoridad del Canal de Panamá](#)

- Acquisition Regulation
- Single Tender Documents
- Tender – Bids/Contracts for Supplies & Services

Based on your market experience, please provide any general comments or observations that may be relevant for this market survey.

SECTION 3 – WARRANTY

Customary Warranty Coverage and Post-Warranty Support Practices

Purpose

The following questions are intended to gather indicative information on customary warranty practices, scope of coverage, response times, and post-warranty technical support typically offered for floating cranes of similar size and operational profile.

- 3.1. Could you indicate whether your company can provide a warranty period exceeding three hundred sixty-five (365) calendar days after final acceptance of the floating crane in the Republic of Panama? If yes, please indicate the typical duration offered for comparable projects.
- 3.2. What is the customary and/or recommended type of technical services your company provides after the warranty period has expired, including preventive maintenance, corrective maintenance, spare parts support (including any proprietary rights or restrictions related to the acquisition of spare parts), and technical assistance?
- 3.3. Please describe the typical scope of warranty coverage offered by your company for a newbuild floating crane of similar size and complexity, including, as applicable:
 - structural components (pontoon/barge and crane structure),
 - mechanical systems,
 - electrical and control systems,
 - drives, motors, generators, automation, and monitoring systems,
 - spud systems and associated equipment.
- 3.4. During the warranty period, does your standard warranty coverage include corrective maintenance activities at the point of delivery, such as:
 - labor,
 - spare parts and replacement components,
 - consumables,
 - mobilization and travel of technical personnel,
 - logistics and transportation associated with warranty repairs?Please describe any typical limitations or exclusions.
- 3.5. In the event that warranty repairs or corrective works are required, please indicate whether such repairs can typically be performed locally in the Republic of Panama, without the need to:
 - transport the floating crane or major components outside the country, or
 - return the equipment to the manufacturer's facilities abroad.

- 3.6. If local repairs in Panama are feasible, please describe the typical repair approach, including:
- use of on-site repairs or temporary workshops,
 - reliance on local facilities or service partners,
 - types of repairs that can generally be performed locally versus those that may require off-site intervention.
- 3.7. Please indicate whether your organization has local representation, authorized service partners, or certified technicians in Panama or the region capable of supporting warranty and post-warranty repairs for floating cranes of this type.
- 3.8. What are the customary response times under warranty for similar equipment, including:
- initial technical response after notification,
 - mobilization of technical personnel,
 - execution of corrective repairs?
- 3.9. Please identify any customary warranty exclusions, limitations, or operational conditions that typically apply to floating cranes operating in:
- continuous or multi-shift operations,
 - clamshell dredging activities,
 - fresh water and salt water environments,
 - tropical and marine conditions similar to those of the Panama Canal.
- 3.10. Based on your experience with floating cranes of similar size and operational profile, please comment on customary market practices for managing technological obsolescence and ensuring long-term lifecycle support, including the typical duration for which such support or associated guarantees are provided.

4. TECHNICAL TERMS

High-Level Technical Concepts and Typical Design Approaches.

This section is intended to understand typical technical concepts, design philosophies, and solution approaches adopted by the market for floating crane projects of this nature. Detailed engineering or project-specific designs are not required at this stage.

- 4.1. Please review the attached Floating Crane Technical Specifications (Preliminary) and provide comments/suggestions.
- 4.2. How will you work with your subcontractors in that respect? Would you propose another type of association for the purpose of this contract? Please clarify.
- 4.3. In comparison with our basic requirements, how many floating cranes (or cranes for floating equipment) of similar sizes and complexities have you engineered and built? Please provide references, including dates of construction. 'Similar' means equal or greater capacities; electrically driven cranes mounted on barges.

- 4.4. Where do you propose to build the pontoon (barge)? Where do you propose to build the crane?
- 4.5. Which companies or brand names would you propose for the machinery and equipment, including major electrical equipment, drives, generators, and the crane?
- 4.6. ACP is evaluating a delivery structure based on DAP (Delivered at Place), whereby the floating crane would be delivered, installed, commissioned, and tested in the Republic of Panama, until ready for operation.
- 4.7. Please describe your experience with this delivery approach for comparable projects, including any typical limitations, risk considerations, standard limitation of responsibility clauses or alternative delivery terms that may be proposed by the market.
- 4.8. We would like the accommodation, or part of them, to be on the deck, within the crane operating area (i.e. under the crane radius). Do you think this is feasible for the type of crane we are requesting, and what could you propose in this regard?"
- 4.9. What would be your proposed delivery method? Could a semi-submersible vessel be used for delivery?
- 4.10. Based on your experience delivering similar floating crane or major marine equipment projects, please briefly describe the typical project phases and planning approach followed after contract award (e.g., design, procurement, fabrication, testing, delivery, and final acceptance).
- 4.11. As part of your technical proposal for the public tender, can you provide the Total Cost of Ownership (TCO) for the main engines?
- 4.12. As part of your technical proposal for the public tender, can you provide the Total Cost of Ownership (TCO) for the complete floating crane?

5. CLASS, STANDARDS AND QUALITY ASSURANCE

Recognized Classification, Standards, and Quality Systems Commonly Applied.

This section seeks information on customary classification societies, standards, and quality assurance frameworks typically applied by the market in floating crane projects. Responses should reflect generally accepted practices rather than project-specific commitments.

- 5.1. Will the barge and the crane be designed, built, and classed in accordance with the rules of a recognized classification society that is a member of the International Association of Classification Societies (IACS), and what is the designated classification for this floating crane?
- 5.2. What quality assurance standards and protocols do you propose to apply for a project of this type?
- 5.3. Do you have a quality control system in place that is ISO 9001:2008 or 2015 certified? Could you describe the project management methodology for this type of project?
- 5.4. What production standards are used by the crane manufacturer and the building yard? Could you design and build in accordance with well recognized Western European, North American, or Japanese standards?

- 5.5. Will you meet the requirement that all steel for the hull, piping, and crane be new, certified, and tested before construction? Will you meet the requirement that all steel for hull, piping and crane has a certificate of origin? Is it possible to request that steel for hull and crane, for instance, has a specific origin?
- 5.6. What customary and/or recommended warranty terms does your company provide for the delivered equipment, in particular for this project?
- 5.7. Will this crane need to comply with IMO's Ballast Water Management convention, which starts to be enforced on September 2017?
- 5.8. What safety and environmental regulations does your floating crane design comply with? Will the proposed design meet applicable IMO, MARPOL, and classification society requirements, as well as any other international or national regulations relevant to non self propelled floating equipment?
- 5.9. Based on applicable environmental regulations, is it necessary for the crane to incorporate grey-water holding tanks? If so, what capacity and system configuration do you recommend?
- 5.10. What factory acceptance tests (FAT) and site acceptance tests (SAT) do you propose, including dynamic load tests and endurance runs?
- 5.11. What international standards will you apply for the corrosion protection system (e.g., ISO 12944, ISO 8501/8503, NACE/SSPC, or equivalent)?
- 5.12. What surface preparation grade (e.g., Sa 2.5) will be applied, and what QA/QC procedures (e.g., anchor profile verification, DFT measurements, holiday testing, and environmental condition monitoring) will you follow? Please indicate the inspection standards to be used (ISO 8501/8503, NACE/SSPC, or equivalent).

6. CRANE

Typical Crane Configurations, Capabilities, and Design Practices.

The objective of this section is to gather market reference information on crane configurations, drive systems, performance characteristics, service life expectations, and operational considerations commonly adopted in similar floating crane applications.

- 6.1. Please indicate whether the crane proposed for this application would typically be a standard, commercially available, and proven model currently in service. Proprietary rights?
- 6.2. Please indicate which type of crane drive system is typically recommended for applications of this nature (mechanically driven or electrically driven), and briefly explain the main technical, operational, and maintenance considerations supporting such recommendation.
- 6.3. Please indicate whether, based on customary market practice, the total power required for full crane operation can be supplied by generator sets installed in an engine room located below deck within the pontoon/barge.
If applicable, please describe any typical constraints or design considerations associated with this configuration.

- 6.4. Please describe the typical market practice regarding system design responsibility and supply scope for the crane and pontoon/barge equipment in floating crane projects of this type, including:
- which party usually acts as system designer and integrator, and
 - how responsibilities are commonly allocated between the crane manufacturer, shipyard, and key suppliers.
- 6.5. Based on your experience with comparable projects, please indicate the typical service life expectancy of a floating crane of this type, and describe the general operating conditions and assumptions under which such service life is normally achieved.
- 6.6. Please describe the typical service life expectancy of major crane systems and components (e.g., structural elements, slewing systems, drives, motors, bearings). Additionally, please indicate, at a high level, the customary safety factors or design considerations applied to:
- main crane components,
 - attachments, and
 - crane foundations and mountings.
- 6.7. For similar floating crane applications, please describe the customary types of slewing mechanisms and mounting arrangements (e.g., mechanical connection, crane foundation) used to install the crane on the pontoon/barge. Please also indicate the typical expected service life of the slewing bearing and mounting system based on operational experience.
- 6.8. Please describe the factory tests that are customarily performed for cranes of this type prior to delivery to the floating crane building yard. For planning purposes, please indicate the typical duration of such factory testing activities before the crane leaves the manufacturer's facilities.
- 6.9. Please describe the basin tests, sea trials, and functional crane tests that are typically performed at the building yard for floating cranes of this type. Additionally, please indicate the typical duration of:
- basin tests,
 - sea trials, and
 - crane functional and performance tests prior to departure from the building yard.
- 6.10. Based on your previous experience, please describe typical operational or technical issues that have been observed in floating cranes over their service life, and the customary design, operational, or maintenance measures used to mitigate such issues. Examples may include, but are not limited to:
- boom cracking,
 - slewing ring wear or replacement,
 - excessive vibration,
 - crane foundation or structural support issues,

- stability challenges during slewing operations.
- 6.11. Please describe the stability and trim criteria that are typically applied in the design of floating cranes of this type.
Additionally, please indicate whether, based on prior experience, floating cranes can be designed and built to comply with stability requirements similar to those outlined in the Technical Specifications.
- 6.12. Based on customary market practice, please indicate how crane electrical loads are typically distributed among main generator sets to ensure acceptable operational performance and availability.
Please also comment on whether a single generator set would be capable of carrying the full electrical load of the crane during operation, while a second generator set remains in *stand-by* mode, either for maintenance purposes or as operational redundancy. Please also comment on whether the emergency generator would be capable of supporting crane operations at a reduced operating capacity.
- 6.13. Based on typical barge dimensions used for floating crane applications, please indicate the lifting capacities that can generally be achieved.
If available, please provide an indicative or preliminary general load chart for comparable floating crane configurations.
- 6.14. Please indicate whether floating cranes of this type are typically designed to operate with a clamshell bucket, and whether such configurations provide the range of motion, control, and operational performance normally required for dredging operations.
- 6.15. Please indicate whether an electrically driven crane can provide a *free fall* function (free fall of the hook or load). If so, briefly describe the proposed solution and any relevant conditions or limitations.
- 6.16. ACP anticipates that the floating crane may be required to perform lifting operations in shallow water or bank areas of the Canal, including locations where the pontoon/barge may be partially or fully supported on the bank (“landing craft”–type operations). Such areas may present variable and irregular ground conditions, including sand, rocks, sharp rocks, and metallic debris.
Based on customary market practice and experience with comparable floating crane applications, please describe, at a high level, the typical pontoon/barge hull design features and construction practices recommended to support safe lifting operations under these conditions, including considerations related to:
- hull bottom configuration,
 - structural reinforcement or protection measures,
 - materials or coatings commonly used to mitigate abrasion or localized contact damage,
 - any customary operational limitations or design assumptions applicable to such operations.
- 6.17. Please describe the customary nominal and maximum operating speeds for hoisting, trolley travel, and gantry travel for floating cranes of this type, under:
- no-load,

- partial-load, and
 - full-load conditions.
- 6.18. Considering that floating cranes may operate in navigation channels where unplanned outages can affect operations, please describe the types of operational redundancies typically incorporated in similar projects to enhance availability and fault tolerance. This may include, for example:
- redundant hoist mechanisms,
 - drive systems or motors,
 - power supply arrangements,
 - control systems or failover modes,
 - other design features intended to maintain functionality in the event of component failure.

7. ELECTRICAL AND MECHANICAL

Customary Electrical, Automation, and Mechanical System Architectures.

This section focuses on understanding typical electrical, automation, control, and mechanical system arrangements used in floating cranes of this type, including redundancy, monitoring, and maintainability considerations.

- 7.1. Please indicate the electrical codes and standards that are typically applied to cranes of this type (e.g., IEEE 45 or equivalent marine standards).
- 7.2. Please indicate whether, based on customary practice, open programmable logic controllers (PLCs) are used, allowing future parameter adjustments by the buyer's technical personnel. If applicable, please indicate whether PLC programming software is typically furnished as part of the project.
- 7.3. Please describe the types of adjustable speed drives / variable frequency drives (VFDs), automation controllers (PLCs), and human-machine interfaces (HMIs) that are commonly used in floating cranes of this type.
- 7.4. Please indicate the customary voltage levels and electrical frequency used for the main crane feeder in similar projects.
For reference, ACP prefers 60 Hz. Please indicate which voltage and frequency combinations are typically available.
- 7.5. Based on typical crane capacities of this size, please indicate the power requirements and main supply voltage levels commonly applied (e.g., 230 V, 480 V, 690 V).
- 7.6. Please indicate the customary rated voltage used for shore power connections in comparable floating crane applications.
- 7.7. Please indicate whether voltage regulation and surge mitigation devices are typically incorporated at the shore power connection, and briefly describe common solutions used to address voltage fluctuations or spikes.
- 7.8. Please describe the customary control and monitoring architecture for floating cranes of this type, including:

- the number of control rooms typically provided,
 - the scope of control and monitoring functions at each control room,
 - whether control rooms are interconnected, and
 - a high-level description of the control system's performance and capabilities.
- 7.9. Please indicate whether floating cranes of this type are typically equipped with crane position and load monitoring systems, and briefly describe the main components and functions of such systems.
- 7.10. Please indicate whether monitoring systems customarily include historical data logging capabilities, and, if so, what types of operational data are typically recorded.
- 7.11. Please indicate whether floating cranes of this type are typically equipped with a Condition Monitoring System (CMS), and briefly describe the main systems or parameters monitored.
- 7.12. Please describe the types of harmonic distortion mitigation schemes that are typically applied in floating crane electrical systems.
- 7.13. Please indicate whether motors and electrical equipment are typically marine-grade and suitable for mobile equipment applications, including whether totally enclosed electrical or electronic systems are commonly used for marine environments.
- 7.14. For any onboard or auxiliary combustion engines, please indicate whether engines complying with Tier 3 or higher emission standards (EPA, IMO, or equivalent) are typically available and used in similar projects.
- 7.15. For long-term operation, maintenance, and post-warranty support, please indicate whether it is customary to deliver complete as-built software and configuration documentation for crane and barge control/automation systems, including, as applicable:
- PLC programs,
 - HMI/SCADA projects,
 - configuration and parameter files,
 - backups, licenses, and access credentials.
- Please note that any such deliverables would be subject to appropriate contractual provisions to protect intellectual property and define permitted use by ACP.

8. TRAINING

Typical Training Programs and Knowledge Transfer Practices.

- 8.1. The purpose of this section is to identify customary training approaches, scope, provided for floating crane projects, including operator, maintenance, and technical system training at the place of destination and the manufacturers premises.
- 8.2. Please describe the types of training typically recommended for floating crane projects of this nature, including:
- factory-based training for the crane and floating crane assembly,
 - training at the building yard,
 - recommended timing, duration, and approximate number of participants.

- 8.3. Please indicate whether crane operator cabins are typically designed to accommodate an operator seat and an additional seat for an apprentice or assistant.
- 8.4. Please describe the types of training that are customarily conducted at the owner's premises for floating crane projects.
- 8.5. Please indicate whether advanced training on the crane and barge control systems—including system components, adjustments, diagnostics, and programming—is typically available as part of similar projects.

9. SPUD SYSTEM

Common Market Practices for Spud Equipment and Drive Systems

This section seeks reference information on typical spud system configurations, drive technologies, and spare parts practices commonly adopted in floating crane applications.

- 9.1. Please describe whether electric-driven or hydraulic-driven systems are typically used for spud equipment in floating crane applications, and the main considerations influencing this choice.
- 9.2. Please indicate whether rack-and-pinion designs are customarily used for spud drive systems, and whether such systems are typically electric- or hydraulic-driven.
- 9.3. Please describe the types of spare parts that are typically supplied or recommended for floating cranes of this size and capacity at the time of delivery.
- 9.4. Please describe the typical spud system configuration used in floating cranes of similar size and operational duty, including the number of spuds and the typical operational arrangement (e.g., two spuds in operation and one spare).
- 9.5. Based on customary market practice, please indicate the typical water depths and seabed conditions (e.g., mud, clay, sand) for which spud systems for floating cranes of this type are normally designed.
- 9.6. Please describe common spud handling and positioning concepts, including spud lowering and raising methods, typical operating speeds, and the customary use of simultaneous operation of multiple spuds.
- 9.7. Please describe the free-floating operating mode typically provided in floating crane spud systems, including how spuds are disengaged or declutched, how frequently this mode is used during normal crane operations, and whether the disengagement mechanism is normally mechanical, hydraulic, or a combination of both.
- 9.8. Please describe the typical structural arrangement of spud guides and casings, including standard measures for wear control, the use of liners or sacrificial components, and methods employed to limit lateral loads and secondary forces during operation.

- 9.9. Based on prior experience, please indicate the typical load cases considered in the design of spud systems for floating cranes of this nature (e.g., crane lifting loads, environmental loads, and combined loading scenarios).
- 9.10. Please indicate whether spud position or load monitoring systems are customarily provided, and, if so, whether such systems are typically used solely for monitoring purposes and whether spud operation can normally continue in the event of monitoring system failure.
- 9.11. Please describe customary practices related to physical depth markings or other visual indicators provided on spuds to support operational awareness.
- 9.12. Please provide references or examples of floating cranes or similar equipment delivered with spud systems comparable to those described above, including information on the general operating environment, approximate duty profile, and years of service.

10. SPARE PARTS, MAINTENANCE, AND LIFECYCLE SUPPORT

Indicative Lifecycle Support and Spare Parts Availability

The following questions aim to collect high-level information on spare parts availability, lifecycle support practices, and maintenance planning typically offered by the market for similar equipment.

- 10.1. Please describe the typical availability of spare parts for the equipment offered, including expected lead times for critical components.
- 10.2. Please indicate whether, as part of technical support practices, spare parts packages or recommended replacement parts lists are typically provided for the first ten (10) years of operation.
- 10.3. Please describe the customary replacement or overhaul intervals recommended for major floating crane components, including crane-specific parts.

11. ADDITIONAL TECHNICAL AND REGULATORY CONSIDERATIONS

Other Relevant Market Practices and Reference Information.

Respondents are invited to provide any additional information, references, or observations that may be relevant for ACP's market assessment and future procurement planning.

- 11.1. Please provide any additional references, case studies, or technical specifications related to floating cranes and pontoons similar to those described in the attached preliminary specifications.

- 11.2. For planning purposes, please indicate whether preliminary design information is typically provided at the proposal stage, such as:
- general arrangement drawings,
 - crane technical details,
 - load case evaluations,
 - performance data,
 - power calculations,
 - principal dimensions,
 - stability calculations, or similar technical information.
- 11.3. Please indicate whether floating cranes of this type are typically equipped with fire detection, alarm, and control systems, and briefly describe the main components of such systems.
- 11.4. Please indicate which international conventions, codes, or regulations are typically applicable to the design, construction, and supply of floating cranes of this type.
- 11.5 Insurance: The terms of the insurance policies commonly offered, from the date of commencement of the work, until delivery, without limiting obligations and liabilities.

The Panama Canal Authority appreciates the time and effort invested by respondents in reviewing this questionnaire and sharing their market experience and insights.

The information gathered through this RFI will support ACP's internal market assessment and contribute to the development of a well-informed, realistic and competitive future procurement strategy for floating crane equipment.

ACP values constructive, experience-based feedback that reflects current market practices and operational realities.

All interested parties intending to participate in this market survey are required to submit their responses and any related inquiries, in digital format, to cnavarro@pancanal.com, with a copy to EVargas@pancanal.com.

Design, Construction, Testing, and Delivery of One Non-Self-Propelled Floating Crane Barge

1. BACKGROUND

The floating crane Goliath is a non-self-propelled barge with a Manitowoc Vicon 4600, Series 3, S/N 46614, pedestal mounted, fully revolving, used for general lifting operations and clamshell dredging in the Panama Canal. The barge has auxiliary machinery, accommodation spaces below deck, working area for transporting equipment, components, and parts to be lifted, and three (3) spud wells and two (2) spud poles for fixing the position during operation in the Panama Canal navigation channel and operating areas bottom. For more details, see annex No. 1 and No. 2.

2. PRELIMINARY TECHNICAL REQUIREMENTS

2.1 Scope of work

This specification covers the design, construction, testing, and delivery of one completely functional non-self-propelled floating electric crane. The floating crane shall be fully revolving and shall have a safe working load (SWL) equal to or greater than ninety (90) metric tons, and capable of performing clamshell dredging operations using a 6.5 m³ bucket with an effective dredging depth of up to thirty (30) meters below the waterline. The floating crane shall be suitable for marine construction, pile handling, heavy equipment handling, clamshell dredging, and general activities within and adjacent to the Panama Canal navigation channel, including Gatun Lake (fresh water), as well as ports and approach channels (salt water).

2.2 Barge The Contractor shall design, manufacture, test, and deliver a non-self-propelled, heavy-duty steel barge constructed from marine-grade steel. The hull shall incorporate double plating along the stern area, including 25.4 mm reinforcement plates, to increase structural strength and ensure safe grounding operations in shallow or rocky areas. The barge shall have approximate principal dimensions of 35 m length, 15.25 m beam, and 3.50 m structural depth. The working deck shall provide a minimum clear area of twelve (12) by twenty (20) meters with a structural load capacity of not less than 10 t/m² and shall be fitted with Douglas Fir timber planking for improved distribution of concentrated lifting loads.

All design, construction, and testing activities shall comply with the applicable classification society rules, regulatory requirements, and these specifications.

2.2.1 Form: The Hull shall be of the barge type and propulsion shall be by towing on a hawser for ocean moves and by tugs either pushing or towing for short moves within the Panama Canal and its approaches.

The hull of the floating crane shall be of the barge type, suitable for operations in inland and coastal waters of the Panama Canal. It shall be non-self-propelled and designed for transportation by towing. For ocean passages, towing shall be performed using a hawser. For local maneuvers within the Panama Canal system and its approaches, movement shall be conducted by tugboats either by pushing or towing. The hull shall have a straight, rectangular geometry with rounded

corners to aid maneuverability and reduce stress concentrations, facilitating safe handling during docking and positioning.

2.2.1.1 Hull beam: 15.25m (+5%)

The overall beam of the barge, shall be **15.25 meters**, with an allowable variation of **±5%**. This dimension is intended to ensure operational stability during heavy lifting activities and compatibility with towing, mooring, and navigation requirements in the Panama Canal and its surrounding areas. The beam shall be designed considering access to locks and maneuverability constraints within canal infrastructure.

2.2.1.2 Full length: between 35 & 40 m

The overall length of the barge shall be between **35 and 40 meters**. This range is intended to ensure structural stability, proper crane foundation integration, and adequate working deck space, while maintaining compatibility with Canal infrastructure, including navigation locks, mooring berths, and support craft operations.

2.2.1.3 draft: 1.20m (+/-5%)

The operational draft of the barge shall be approximately **1.20 meters**, with an allowable tolerance of **±5%**. This draft shall be achieved under full operating conditions, including full equipment load, tanks in service condition, and crane at maximum outreach. The design draft must allow the crane barge to operate effectively in shallow inland waters and approach areas within the Panama Canal system, while maintaining sufficient freeboard and stability under lifting operations.

2.2.2 It is desired that the main accommodations be located on the main deck, below the crane's slewing ring. A minimum of two changing rooms for the crew and two changing rooms for the officers shall be included; these deck-mounted accommodations shall not form part of the vessel's buoyancy or watertight integrity.

2.2.3 The barge shall be equipped with four (4) winches, one located at each corner, each with a minimum capacity of four (4) metric tons. Winches shall be fitted with swivel-type fairleads. Wire ropes shall exit and enter the drums from the lower side, as close to deck level as possible, and shall lead directly to the fairleads. Winch controls shall be installed at the bow and stern positions, providing clear visibility of the drums and the areas influenced by each winch.

2.2.4 Bow reinforcement for landing craft operations:

The barge structure shall be specially reinforced in the bow area, directly below the crane foundation, to safely support landing craft-type operations. This reinforcement shall be designed to allow the floating crane to perform full-load lifting operations while the bow is grounded or partially supported on the shoreline.

The reinforced bow structure shall be capable of withstanding concentrated loads, abrasion, impact, and localized stresses resulting from contact with uneven or abrasive

materials, including but not limited to rocks, sharp rocks, metal debris, concrete fragments, and similar hard materials commonly found along canal banks and working areas.

2.3 Spuds

- 2.3.1 The floating crane shall be provided with three (3) identical steel spuds of adequate strength and length to safely anchor and stabilize the crane under all operating conditions. The spuds shall not interfere with the crane's lifting or dredging operations.
- 2.3.2 The length of each spud shall be sufficient for operations in minimum water depths of twenty-five (25) meters, with at least five (5) meters embedded into the seabed.

2.4 **Crane.** Design, manufacture, test and deliver a heavy duty and fully revolving crane in compliance with Class requirements, regulations, and in accordance with this document. The floating crane shall be fully revolving and shall have a safe working load (SWL) equal to or greater than 90 metric tons, and capable of performing clamshell dredging operations using a $\geq 6.5 \text{ m}^3$ bucket with an effective dredging depth of up to 30 meters below the waterline.

2.4.1 Minimum preliminary requirements:

- 2.4.1.1 The crane shall be a standard model of current production, incorporating technology, systems, and components that are actively supported by the manufacturer. Major equipment, assemblies, and associated spare parts shall not be in the process of being discontinued nor scheduled for obsolescence within fifteen (15) years after delivery. It is expected that the crane will have a design service life of no less than twenty-five (25) years under normal operating conditions.
- 2.4.1.2 The crane shall be pedestal-mounted and shall be capable of 360° continuous, fully revolving rotations without mechanical or operational limitations.
- 2.4.1.3 The boom shall be a lattice-type structure composed of modular sections, each having an individual length of at least 6.25 m. The boom shall be designed to allow configuration from 25 m up to a maximum of 85 m, depending on operational requirements. Jib extensions are not required.
- 2.4.1.4 For delivery, the crane shall be supplied with the minimum boom sections required for basic operations, consisting of one (1) bottom section of approximately 12.5 m, one (1) top section of approximately 12.5 m, one (1) insert of approximately 12.5 m, and one (1) insert of approximately 6.25 m. Additional inserts required to achieve boom lengths beyond this minimum configuration and up to 85 m shall be considered optional.
- 2.4.1.5 The crane's boom and hoisting arrangement shall provide sufficient under-hook height to fully lift and handle any of the barge's spuds without geometric interference or operational restrictions. The required headroom shall be achieved considering:

- the maximum spud overall height,
- the complete hoisting tackle/block set and hook approach,
- the rigging length (slings/shackles/spreader, as applicable)
- the minimum safe boom angle in working position. No part of the boom tip, pendant lines, topping gear, or auxiliary structures shall limit the lifting, extraction, or placement of any spud within the crane's rated working area.

2.4.1.6 The main hook shall be configured as a multi-part reeving system with no more than eight (8) parts of line or sheaves. A duplex (double) hook shall be provided as part of the main hook block assembly. The main hook shall include an integrated load indicator or load measuring system.

2.4.1.7 The auxiliary hook shall be configured with a single-part line only. The crane shall be designed to allow installation of a second auxiliary hook in the future, even if removal of the main hook is required to accommodate this configuration.

2.4.1.8 All hooks shall be manufactured from materials with adequate hardness and mechanical properties to withstand operation with steel wire ropes without suffering marking, indentation, or surface deterioration under rated loads.

2.4.1.9 Both the main and auxiliary hooks shall be capable of operating in free-fall mode, in accordance with the manufacturer's safety provisions and applicable standards.

2.4.1.10 The crane shall be equipped with a tag line system rated for a minimum load of three (3) metric tons. The tag line shall utilize a wire rope with a diameter not less than 19 mm (3/4 in), in accordance with the manufacturer's recommended construction and applicable safety factors for tag line operations.

2.4.1.11 Each crane function shall be driven independent from each other.

2.4.1.12 Winch drums shall be grooved and equipped with mechanically-activated parking brakes. The braking system shall engage automatically when the control is in neutral or when the winch is not being powered, providing a positive, mechanical means of holding the load. The groove profile shall be compatible with the selected wire rope diameter and construction, ensuring proper spooling and minimizing rope wear.

2.4.1.13 The crane operator's cabin shall be installed at a height that provides adequate visibility for safe control of all operations. The cabin shall comply with applicable noise and vibration limits and relevant industry standards.

2.4.1.14 The crane machinery room shall comply with applicable industry safety standards and shall include noise-abatement measures.

2.4.1.15 Engines shall comply with EPA Tier 3 or higher emissions requirements. As an alternative, engines with the capability to operate on alternate fuels with modifications may be considered.

2.4.1.16 Other crane drive system options may be considered. For example, fully electrically-driven configurations may be evaluated as alternatives.

2.4.1.17 A pile-driving hammer shall be provided for driving piles as required for operational support.

2.4.1.18 Operational requirements: Refer to TABLE 1 below for typical operations performed by crane Goliath. The capacities shown shall represent the minimum required operating capacities (lifting and clamshell) for the new floating crane.

Table 1: Some typical operations in the Panama Canal with a 140 ft (43 m) boom length

Operations	Pounds (lbs.)	Radius (ft)	Metric tons (ton)	Radius (m)
Clamshell dredging	50,000	60	22.7	18.3
Equipment to be lifted:				
Spillway gates	100,000	70	45.4	21.3
Backhoe dredge stick attachment	80,000	70	36.3	21.3
Cutter suction dredge discharge pipes	47,000	100	21.3	30.5
Locks dewatering valves	128,000	50	58.1	15.2
Heavy equipment transport	90,000	65	40.8	19.8
Launches	60,000	80	27.2	24.4
Locks locomotive	118,000	50	53.5	15.2
Salvage and rescue operations	170,000	40	77.1	12.2
Load test:				
Floating crane testing	176,000	34	79.8	10.4

Note: (1) Radius = horizontal distance from centerline crane rotation to the point of load suspension.

2.4.1.19 The crane shall be equipped with a clamshell bucket with a capacity of not less than 6.5 cubic meters. The bucket shall be suitable for dredging materials ranging from mud to basalt rock, and capable of operating at dredging depths of up to 30 meters below the waterline.

Clamshell capacities: Refer to Table 2 below. This operational mode may be used for shoal chasing, dredging, or removing shoals or debris from navigation channels, as well as heavy-duty cycle dredging.

Table 2 Clamshell Capacities

Item	Value	Unit
Bucket size	6.5	cubic meter
Effective dredging reach below water	30	m
Winch line pull	18.14	metric ton
Reference wire rope diameter	38.1	mm
Wire rope safety factor	5:1 to 6:1	—
Wire rope drums	to be grooved	—

3. Operations in the Panama Canal

The new floating crane will be used primarily for lifting operations and clamshell dredging in the Panama Canal. The equipment will typically be towed to the work site, either alone or with other barges, with or without deck cargo, where operations such as load transfer or dredging will take place. Typical work areas include Canal locks, dock facilities, spillways, dams, dry dock facilities, dredging support areas, and navigation channels for various operational needs.

During operations and standby, the floating crane will use its spud systems to maintain position. The crane may be operated on a single shift of eight to twelve hours or on two extended shifts of twelve hours each, depending on operational requirements. Annual operating hours shall not be less than 1,500 hours.

ANNEX No. 1

Goliath Crane - Reference Pictures for Operating Conditions



Figure 1 Transit of the Goliath crane through the Panama Canal



Figure 2 Figure 4 Reconditioning and technical servicing of the dredger Alemán Zubieta



Figure 3 Handling and lifting of boats

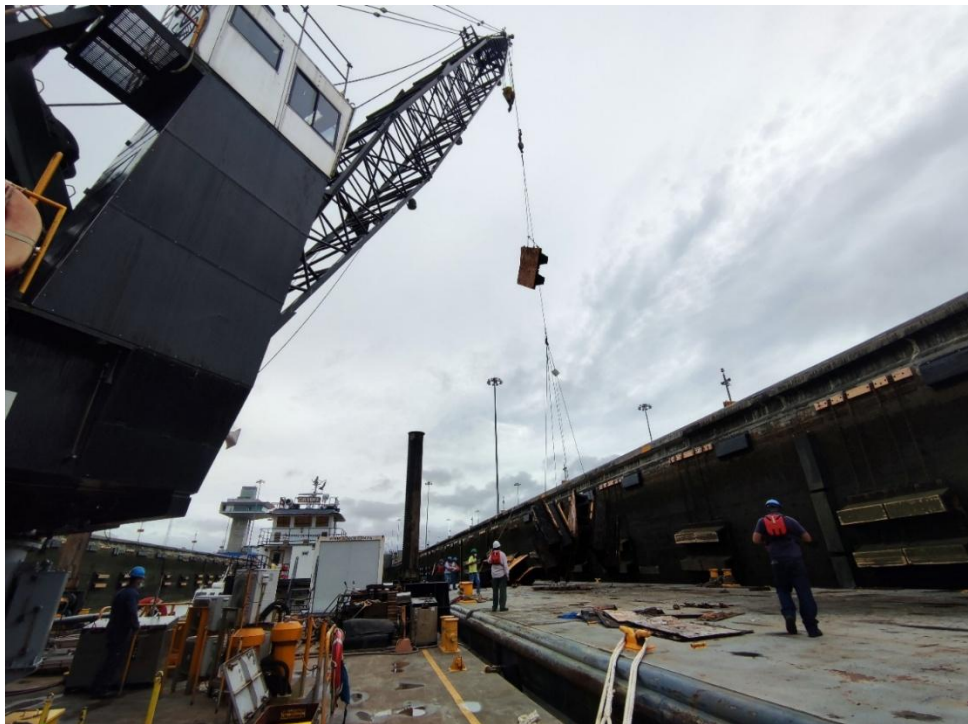


Figure 4 Fender removal and installation at Neopanamax Locks



Figure 5 Installation and removal of mooring buoys



Figure 6 Pontoon lifting operations for Quibián dredger pipeline support



Figure 7 Pipeline hoisting procedures for the Quibián dredger

ANNEX No. 2

ENVIRONMENTAL CONDITIONS AT THE PANAMA CANAL AREA

1. General Climatic Conditions:

- a. The climate of the Panama Canal is characteristic of low latitudes in the tropics, with moderately high temperatures and humidity throughout the year.
- b. Normally, the year is divided into four months of dry season mid-December to mid-April, and eight months of rainy season for the remainder of the year.
- c. Thunderstorms occur frequently during the rainy season along both the Atlantic and Pacific coasts. At times, these storms are intense, with strong gusty winds and severe lightning.

2. Ambient temperatures:

- a. The isthmus of Panama does not undergo any marked seasonal or day-to-day variation in temperature.
- b. April is usually the warmest month, and November the coolest, with a difference of only 1.1°C on the Atlantic side and 1.7°C on the Pacific side. (see Table N°1 below).

3. Fog:

- a. During the rainy season, fog typically forms after midnight and dissipates or rises between 7:30 a.m. and 8:30 a.m. Its occurrence and density vary considerably. The average duration of dense fog since 1961 is approximately 80 hours per year.

4. Relative humidity:

- a. Considerable variation in relative humidity occurs between the dry and rainy seasons.
- b. The relative humidity percent average in the middle seventies from January through April, and in the upper eighties from May to December (see Table N°1 below).

5. Winds:

- a. See table N°1 for wind data.

6. Rainfall:

a. The heaviest rainfalls are of short duration, typically 15 minutes or less. Steady rains are usually in order of 40 mm/hr.

b. Table N°1 provides rainfall data.

7. Tides:

a. For information on Atlantic and Pacific Ocean tidal levels visit:
<https://pancanal.com/en/tide-tables/>

8. Other environmental conditions:

a. shown in Table N°1.

TABLE N°1 – ENVIRONMENTAL DATA	
Air Pollution	Dust and gases from smoke
Altitude	Anywhere between sea level and 35 meters
Ambient Temperature	Between 13°C and 41°C, with an average of 27°C
Rainfall	Up to 180 mm/hr, with a yearly average of 2600 mm
Relative Humidity	From 60% to 100%, with an average of 78.5%
Solar Radiation	Up to 27.8 million Joules/m ² per day, with a daily average of 16.6 million Joules/m ²
Wind Speed	Average daily wind speed of 6.0 km/h, with gusts up to 90 km/h during thunderstorms
Other	Salty and brackish water and minerals in the air