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	<b>PROGRAM:</b>	<b>WELLS</b>					<b>FOLHA:</b>	1 OF 21		
	<b>AREA:</b>	<b>WELL STRUCTURE - SUBSEA WELLHEAD SYSTEMS (SCPS)</b>								
	<b>TITLE:</b>	<b>SUBSEA WELLHEAD SYSTEM INSTALLATION SERVICES</b>					<b>PUBLIC</b>			
<b>NO SCALE</b>										
<b>REVIEW INDEX</b>										
<b>REV.</b>	<b>DESCRIPTION AND/OR LEAVES AFFECTED</b>									
0	Original Issue									
A	Amendment of items 2.1.1, 2.4, 2.4.2, 2.14, 2.15, 3.5.1, 5.6, 5.9.2, 6.1, 7.2.1, 7.4.1, 7.5, 8.3, 8.4.									
B	Inclusion of item 2.4 to meet reliability requirements.									
C	Inclusion of items for <i>onshore</i> assembly services for tools, equipment and supplies and creation of an item for resource logistics.									
D	Inclusion of preventive maintenance services.									
E	Changes to the Review WG									
F	Inclusion of items 4.2, 4.4.7.2, 8.6.2, 9.6.4 and 11.5.2 Amendment of items 2.10, 8.8.1, 8.7, 9.2, 9.6, 9.6.2, 11.2 and 11.5.									
G	Substruction of the term CONTRACTOR to PETROBRAS, inclusion of items 2.16 and 6.6, alteration of items 6.1 and 12.3.									
	REV. 0	REV. A	REV. B	REV. C	REV. D	REV. E	REV. F	REV. G	REV. H	
DATE	01/08/18	25/09/18	11/04/19	19/02/20	27/07/20	01/10/20	26/09/22	17/10/23		
EXECUTION	UPFY	UPFY	UPFY	UPFY	UPFY	UPFY	UPFY	UPFY		
REVIEW						U4FX, BHK9, WTM1, LCL3, BG21	WTM1	WTM1		
APPROVAL	RHY8	RHY8	JGCP	JGCP	DRDK	DRDK	DRDK	DRDK		
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## 1 SCOPE

Provision of Installation Services for Subsea Wellhead Systems.

## 2 GENERAL CONDITIONS


2.1 This instrument covers and defines the procedures for the Installation Services of Subsea Wellhead Systems and consists of the execution of various services designed to ensure that the needs of offshore operations are met, related to wellhead tools and/or equipment and/or their components.

2.1.1 The services consist of mobilization, *onshore* transportation, operation of installation or recovery of wellhead equipment and testing, maintenance, demobilization and other *offshore* services, associated with the installation tools of the Subsea Wellhead Systems, according to the CONTRACTOR operating procedure, in agreement with PETROBRAS;


2.1.2 All operations must be carried out safely, prioritizing the value of life and complying with: PETROBRAS HSE requirements, the supplier's operating procedures after approval by PETROBRAS and the relevant maritime regulations;

2.2 The CONTRACTOR shall conduct its operations in strict compliance with the current legal standards of Safety, Environment and Occupational Health, for the protection of personnel, facilities and materials of PETROBRAS, third parties and the CONTRACTOR.

2.2.1 It is mandatory to adopt occupational safety and hygiene measures, in accordance with good technique in operations of the nature of the services contracted and, to this end, it provides its personnel, tools and/or materials with individual fire protection, occupational safety and hygiene equipment, in compliance with the provisions of the Brazilian Consolidation of Labor Laws (well known as CLT) and other legal and specific texts, and is liable for any infringement thereof.

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- 2.3 All tools, equipment and supplies used in the performance of this Contract must meet the quality requirements recommended by the CONTRACTOR, in line with best practices (*benchmarking*) in the oil industry.
- 2.4 All tools, equipment and supplies used in the performance of this Contract must meet the requirements of ET-2000.00-1170-618-P4W-001 - RELIABILITY AND TECHNICAL COMPLIANCE REQUIREMENTS FOR SCPS.
- 2.5 The CONTRACTOR shall carry out all the maintenance required to fulfill this Contract, ensuring a high standard of quality in the maintenance and full operational functionality of the tools it owns.
- 2.5.1 The CONTRACTOR must have at its disposal all the equipment and material necessary to carry out tests and prepare for the maintenance work carried out at its base of operation and at the offshore unit.
- 2.5.2 The CONTRACTOR is responsible for supplying all spare parts and parts used in the installation, testing, maintenance, cleaning and storage of tools and *skids*. Spare parts must be used both on board and on land in such a way as not to affect the continuity and punctuality of service provision.
- 2.6 All parts used in the services and supplied by the CONTRACTOR must be original, with respect to those used in the manufacture of the Tool and/or Equipment, always corresponding to the most current version of the same.
- 2.7 The CONTRACTOR must be available for meetings at any of PETROBRAS headquarters. If the physical presence of CONTRACTOR personnel is required, PETROBRAS must give at least 24 hours for notice.
- 2.8 The CONTRACTOR must monitor and be aware of all operations taking place on the drilling rig under its responsibility.
- 2.9 The CONTRACTOR is responsible for the materials under its responsibility, and its processes must be geared towards the best possible performance of operations.

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2.10 All the tools and materials provided for in the contract must be inspected in advance on the ground by the CONTRACTOR and comply with the requirements of ET-2000.00-1170-618-P4W-001 SCPS RELIABILITY AND TECHNICAL COMPLIANCE REQUIREMENTS.

2.11 The CONTRACTOR must guarantee operational continuity in the event of a failure of any kind for which it is responsible.

2.12 The CONTRACTOR shall make available to PETROBRAS all the technical literature necessary for the execution of the services.

2.13 The CONTRACTOR must keep the basic procedures and drawings necessary for the execution of this Contract up to date and available, and they must be made available in electronic form in the Portuguese language.


2.14 Upon receiving PETROBRAS request for technical and/or operational documentation related to the drawings and *stack-up* of the equipment, the CONTRACTOR shall have a period of 3 (three) calendar days to send the documentation.

- In the event of anomalies and fishing events, not necessarily related to SCPS operation, the CONTRACTOR must immediately provide drawings of the equipment and tools in order to ensure continuity of operation.

2.15 The CONTRACTOR must have uninterrupted technical support to meet operational demands. Technical support consists of providing detailed information on the operation of the equipment and tools involved in the operations, as well as their interfaces with other well construction disciplines (well safety, casing, cementing, fluids, wellhead interface equipment).

2.16 The CONTRACTOR must have a dedicated technician for logistical monitoring. It is a requirement that the representative accompanies the PETROBRAS short-term programming team at the Petrobras base on days when the team is present in order to facilitate the interface and forwarding of demands.

2.17 The CONTRACTOR must have operational procedures for all the operations provided for in the contract.

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2.18 The CONTRACTOR must have an integrated standardization system with update control.

### **3 OPERATIONAL PLANNING**

3.1 The CONTRACTOR is responsible for the individual organization of each operation, involving arranging and listing all the items needed for the operations. This organization must be based on the information obtained from PETROBRAS at least 15 (fifteen) calendar days before the resources need to be moved to the embarkation points.

3.2 The CONTRACTOR is responsible for operational planning appropriate to the operational dynamics inherent in PETROBRAS activities, and must be able to respond promptly to variations in the deadlines expected for wellhead activities, once the front is allocated to a defined intervention (drilling rig and scope).


3.3 The operating procedures used must meet the HSE requirements of the PETROBRAS system.

3.4 The CONTRACTOR is responsible for drawing up an operational sequence that technically translates the operational procedure for each specific case of intervention.

3.4.1 The operational sequence must always be submitted to PETROBRAS more than 72 hours before the start of operations, having been pre-validated by the CONTRACTOR operational supervisor.


3.4.2 It is PETROBRAS prerogative to approve the operational plan with regard to HSE or operational risks.

3.4.3 In the event of disapproval, the CONTRACTOR shall revise the operational plan, without prejudice to the deadline for the start of operations and in good time for PETROBRAS to reanalyze it.

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#### 4 OPERATIONS TEAM

- 4.1 The CONTRACTOR must ensure that its personnel is qualified and quantified, respecting the limit of vacancies on the drilling rig for the operation of the wellhead, and that this qualification and quantification allows it to fully and promptly perform the services that are the subject of this CONTRACT, and consequently it shall be solely responsible for all burdens resulting from the need to increase personnel.
- 4.2 One of the employees on board must have more than 2 years' offshore experience in the Wellhead activity, to act as operational leader.
- 4.3 The CONTRACTOR must ensure that the pre-boarding of operators is carried out in person in Macaé or Rio de Janeiro, always with their respective supervisor.
- 4.3.1 An exception to the above is the case in which the boarding request has been made one (1) day before departure.
- 4.4 The provision of the service by the on-board operator, the scope of which is not limited to:
- 4.4.1 Inspecting the equipment and tools on board.
- 4.4.2 Carrying out maintenance when necessary, operating the tools in order to install the equipment according to the operational sequence.
- 4.4.3 Responding to PETROBRAS pre-shipment call to inform and obtain validation of the operational planning for the period in which they will be on board.
- 4.4.4 Promptly notify PETROBRAS in the event of an operational anomaly.
- 4.4.4.1 Submit the proposal to correct the anomaly to PETROBRAS for approval with regard to HSE or operational risks.
- 4.4.4.2 Complete and submit to PETROBRAS for validation, immediately after correcting or mitigating the risks of any anomaly in progress, a report that must contain a precise, objective and impersonal description of the event, photos and records of the drilling rig (*cyberbase* or similar system for storing the drilling rig's operating parameters).

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4.4.5 Keeping PETROBRAS on-board inspection team fully informed of operational planning, the status of RT's (equipment and tool transportation requests) and the treatment of ongoing anomalies, responding to all calls that may be necessary, whether regular or extraordinary.

4.4.6 During the period on board, to survey and align all material needs (equipment and tools), taking the necessary steps to ensure adequate readiness of resources (shipment of materials), as well as landing, ensuring the correct fulfillment of RT's and identification of materials on the drilling rig, reporting the situation daily to PETROBRAS supervision.

4.4.7 Forward the operational report to the CONTRACTOR within 48 hours of completion of the operation. The CONTRACTOR shall check the report and submit it to PETROBRAS within 24 hours.


4.4.7.1 The issuance of the technical-operational report consists of recording the relevant technical parameters observed during the services carried out on forms in accordance with PETROBRAS standards. This document will serve as proof of the services performed for measurement purposes.

4.4.7.2 The report must be made in the operating system used by Petrobras, recording the information on the materials consumed, including the NM and NS.

4.4.7.3 PETROBRAS reserves the right to demand corrections to the operational report if it deems it necessary, and the CONTRACTOR shall comply fully with such requests.

4.5 Professionals must have knowledge of the equipment they will be servicing, as well as the topics:

- Drilling columns;
- Interface with drilling equipment;
- Components and accessories;
- Control and monitoring system;
- Fluid mechanics;

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- Operating principles;
- Usage parameters and operating limits;
- Installation and removal procedures;
- Disassembly, assembly and testing procedures;
- Maintenance and preservation procedures;
- Safety and the environment.
- Drilling rig equipment (anchoring and dynamic positioning systems, movement compensator, floating switches, column weight recorders, subsea BOP, column handling equipment).

4.6 Trainees may only be taken on board with the prior authorization of the department responsible for the PETROBRAS operation.

## 5 RESOURCE LOGISTICS

5.1 The CONTRACTOR is responsible for all costs associated with the transportation of resources for the execution of services.


5.2 The CONTRACTOR is responsible for the transportation of the tools and/or equipment on the route between the CONTRACTOR base in Brazil and the collection/shipping points designated by PETROBRAS.

5.3 The CONTRACTOR is responsible for the transportation of the tools and/or equipment on the route between the collection/shipping points and the CONTRACTOR base in Brazil, after the end of operations on the drilling rig.


5.3.1 All consumable equipment already purchased by PETROBRAS and not used in an operation must be returned to the contractor's base for preventive maintenance until the next operation.

5.3.2 The CONTRACTOR shall generate a report containing information on the preventive maintenance of PETROBRAS equipment and the information shall be incorporated into the equipment's *data book*.



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- 5.3.3 Consumables purchased by PETROBRAS will be returned to the PETROBRAS base at the end of the contract or at its request. Transportation is the responsibility of the CONTRACTOR.
- 5.4 The CONTRACTOR shall be responsible for collecting and returning the materials to be benefited and processed, including materials owned by PETROBRAS, between the PETROBRAS base and the collection/shipping points designated by PETROBRAS.
- 5.5 The loading, unloading and storage of resources are the responsibility of the CONTRACTOR, when carried out at its base, and of PETROBRAS, when carried out at its base or at embarkation and disembarkation points.
- 5.6 The resources used in cargo handling must be certified and must meet the standards of maritime cargo transportation regulations.
- 5.7 The CONTRACTOR shall provide baskets, containers and other resources necessary for the proper storage of materials delivered to the PETROBRAS base.
- The baskets, containers and other transportation resources are exclusively for moving the resources contained in this contract, and must not be used for other purposes, and must be returned to the CONTRACTOR base only with the resources used in this contract.
  - In addition to handling, the baskets and containers can be used to store equipment on board until the operation is completed.
- 5.8 Inputs returned after operation must be inspected and maintained in accordance with the manufacturer's procedures.
- 5.9 The CONTRACTOR is also responsible for controlling the location, movement, receipt invoice, dispatch invoice, incoming and outgoing shipments and all the services inherent to the shipping activity. This includes the solution of problems caused by the CONTRACTOR that may occur in the processing of documents upon receipt and return of the material.

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5.9.1 The Cargo Transportation Document, prepared and filled in by the CONTRACTOR, must be issued in accordance with the model in force and approved by PETROBRAS, for the shipment and/or unloading of Tools and/or Equipment at PETROBRAS bases.

5.9.2 The CONTRACTOR must remove materials from piers or collection points within a maximum of 2 days of written notification from PETROBRAS (e-mail or other electronic means), provided that the documentation for transportation is available.

5.9.3 If the material is not removed within this period through no fault of the CONTRACTOR, the CONTRACTOR shall be liable to pay a permanence fee, according to the current rate.


## 6 TESTING AND ASSEMBLY/DISASSEMBLY OF ONSHORE ASSEMBLIES (MAKE UP)

6.1 The service consists of testing and mobilizing, at the CONTRACTOR base, the set of equipment, tools and supplies so that they can later be subjected to offshore operations. Included in this tender is the torquing of the casing hanger (SR) and casing pup, as well as other supplies, such as annular sensors, for the construction of the stack-up.

6.1.1 The assembly operation and applicable tests must be carried out in accordance with the specific procedure for each assembly.

6.1.2 Tools, equipment and supplies must be shipped with their parts previously assembled and torqued, ready for direct connection to the work column or casing column.

6.1.3 The CONTRACTOR must provide all the additional resources and supplies necessary for testing and assembling the equipment and tools on the work column, such as *crossovers*, *lift subs* for handling the assemblies and short pipes (from 1.5 meters in length) with mechanical strength requirements, nominal diameter, passage diameter and connections compatible with those of the respective 6-5/8" FH box column and 4-1/2" IF pin.

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6.1.3.1 The cementing accessories (plugs and drive elements) are inputs for the execution of the services. PETROBRAS is responsible for sending these items to the CONTRACTOR site and the CONTRACTOR is responsible for managing the storage of these supplies, so that they are readily available for assembly and meeting operational demand, if necessary.

6.1.3.2 Coatings and accessories are inputs for the execution of services. PETROBRAS is responsible for sending these items to the CONTRACTOR site and the CONTRACTOR is responsible for managing the storage of these supplies, so that they are readily available for assembly and meeting operational demands, if necessary.

6.1.4 The CONTRACTOR shall submit the test and assembly reports for the equipment and tools used in the provision of the service, whenever requested by PETROBRAS.

6.1.4.1 The results of all the tests and the torque graphs for all the connections in the assembly must be attached to the assembly report.

6.1.4.2 The report must contain the dimensions and other parameters that must be observed during the execution of the services.


6.1.5 Part of the scope is the preparation of an inspection report on the connections of PETROBRAS equipment.

6.1.6 The CONTRACTOR shall pack the assembled set-in baskets and/or containers suitable for transportation, in accordance with item 12.

6.1.7 The assembled sets must be sent to drilling rigs properly packaged, with thread protectors and protective covers in the areas of the locking and sealing mechanisms.

6.2 The dismantling service consists of demobilizing all the connected supplies.

6.2.1 The assemblies at the CONTRACTOR base, awaiting shipment or not used in operation, may be subject to disassembly at the request of PETROBRAS.

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6.2.2 After dismantling the assemblies, the CONTRACTOR must store and preserve the materials owned by PETROBRAS until assembly is requested.

6.3 The test consists of simulating the operation of the tool-equipment assembly by carrying out an operational test, as specified by the manufacturer or under other conditions specified by PETROBRAS, in compliance with current regulations.

6.4 The aim is to prove that there is no abnormality in operation or deviation from the conditions established by good technique as appropriate. It includes the issue of a graphical chart, which records and certifies that all the necessary checks have been carried out.

6.4.1 During the test, if necessary, the pressures must be checked in accordance with the specific procedure for the equipment and tool.


6.4.2 The CONTRACTOR shall be responsible for the materials, instruments and tools for the specific purpose of carrying out the tests.

6.5 Optionally, the technical staff appointed by PETROBRAS may accompany the tests and assembly/disassembly.

6.6 In the event of non-compliance with this contractual item, the CONTRACTOR shall be subject to a fine in accordance with the contractual instrument.

NOTE: Exceptions can be made for the following cases:

- a) Service request from Petrobras less than 4 weeks in advance of the equipment being shipped.
- b) Delivery of inputs (hanging pup, annulus sensor, cement plug, etc.) from Petrobras to the contractor's base late, below the 4-week deadline for need in the operation.
- c) Delay in logistical support from Petrobras for tool disembarkation from completed / contingency operations that conflict with the number of simultaneous service fronts. The resource must be available at the contractor's base 8 weeks in advance of the new operation (taking into account previous inspections and maintenance).

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## **7 PREVENTIVE MAINTENANCE OF PETROBRAS SCPS EQUIPMENT**


- 7.1 The CONTRACTOR must carry out preventive maintenance on materials owned by PETROBRAS whenever necessary, which may occur due to the nature of the services. In these cases, the CONTRACTOR must store the materials and carry out preventive maintenance on the equipment in order to maintain its integrity.
- 7.2 After assembling the assemblies or after unloading assemblies not used in the operation, the CONTRACTOR must keep the materials owned by PETROBRAS on its base until shipment or disassembly is requested, or they are returned.
- 7.3 The CONTRACTOR shall carry out preventive maintenance on the items in accordance with the manufacturer's procedures.
- 7.4 The CONTRACTOR must inform PETROBRAS of the recommended period for use of the assembled set, without the need for maintenance. It is up to PETROBRAS to define what will be done with the set that is not used within the recommended period.
- 7.5 Supplies returned after operation must be inspected and maintained in accordance with the manufacturer's procedures. The equipment must be returned to the CONTRACTOR base, which will maintain it until the next operation.
- 7.6 The repair and replacement of supplies due to mechanical damage inherent in use outside of operating standards, improper storage or quality failure of the CONTRACTOR product, will be charged to the CONTRACTOR, and reimbursement will be due for resources damaged, worn out or lost during the execution of the services.

## **8 READINESS OF RESOURCES**

- 8.1 The CONTRACTOR is responsible for the availability of materials at the shipping points designated by PETROBRAS.
- 8.1.1 For shipping points in the state of Espírito Santo, the CONTRACTOR must provide services within 3 calendar days.
- 8.1.2 For shipping points in the state of Rio de Janeiro, the CONTRACTOR must provide service within 2 calendar days.

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- 8.1.3 For shipping points in the state of São Paulo, the CONTRACTOR must provide service within 3 calendar days.
- 8.1.4 For shipping points in the state of Sergipe, the CONTRACTOR must provide service within 5 calendar days.
- 8.1.5 For points of embarkation in states other than those mentioned above, the deadline must be equivalent to the ratio of days and distance observed for the other points of shipping.
- 8.2 The availability of materials corresponds to the response time allowed for the service front at the time it is assigned the drilling rig indicated, minus 48 hours of organization time.
- 8.3 The CONTRACTOR shall keep the tools and materials described in the proposal operationally available at its base of operation to meet PETROBRAS requests, in compliance with the readiness requirements. The availability of resources must be dimensioned by the CONTRACTOR as a way of not compromising the service and continuity of the contracted service front, in the contracted scope, having its own *back up* for this purpose.
- 8.3.1 The CONTRACTOR shall provide services on a continuous basis, without stoppage on Saturdays, Sundays or public holidays, in order to speed up the readiness of Tools and/or Equipment, especially those whose need for readiness has been recently identified and requires priority treatment.
- 8.3.2 The number of staff mobilized to provide services on Saturdays, Sundays and public holidays must cover all needs and be sized in such a way as to guarantee continuity of service.
- 8.4 It is the CONTRACTOR responsibility to provide tools and bushings, in good time and taking into account the contractual mobilization deadlines, in order to meet the contracted service fronts.
- 8.5 The CONTRACTOR must take into account the life expectancy of the resources in its replacement planning, anticipating manufacturing actions.

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8.6 Planning the replacement of bushings (all types) and other tools that wear out as a result of use is an obligation inherent to the provision of services, and it is the CONTRACTOR obligation that this be done continuously and in sufficient quantity to meet the scope of this Contract.

8.6.1 After each operation, the CONTRACTOR must inspect the bushings in order to assess their integrity for later reuse. At PETROBRAS discretion, once they have reached the end of their useful life, they must be replaced.

8.6.2 The inspection must be carried out on the ground and its dimensions assessed.

8.7 In the event of bushings and other tools being damaged (or lost in the well) during operation, not due to faults or malpractice on the part of the CONTRACTOR, the CONTRACTOR will be reimbursed in accordance with the liability clause between the parties in the contract to be signed.

- An inspection or equipment loss report must be submitted which clearly states the evidence after the event has occurred.


8.8 In the event of tools and bushings being deemed unusable by PETROBRAS during an operation on the service front, the CONTRACTOR shall immediately make the tool or bushing available in order to ensure operational continuity.

8.9 If necessary, the request to transship any resources, whether or not used in a previous operation, must be authorized by PETROBRAS.

8.10 The CONTRACTOR shall inform PETROBRAS of its operational situation and history.

8.11 The CONTRACTOR must previously request PETROBRAS to ship contingency resources (backup).

## **9 SERVICE FRONT**

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9.1 A Service Front is understood to be all the tools (including the entire list of bushings), including *backup* tools, the CONTRACTOR own infrastructure, personnel and ancillary services, fully functional and available, in order to subsidize the CONTRACTOR full performance in a maritime intervention unit (drilling and completion rigs) with intervention related to the object of this Contract.

9.2 The scope of the Service Front implies the full range of wellhead operations for the system being served by the front, with a full degree of readiness. Maintenance and personnel (inputs) must be dimensioned by the CONTRACTOR, under its full responsibility.

- Some operations may take place on *dual rig activity* drilling rigs, which would require a more accelerated sequence of operations at the start of the well. Such mobilization will be defined with PETROBRAS during operational planning.

9.3 The CONTRACTOR is obliged to continuously monitor, comply with and respect the dynamics of the schedule relating to the intervention that is allocated to the drilling rig, and it is its duty to scale itself to fully comply with the contracted fronts.

9.4 The Service Front must have continuity and readiness, implying the CONTRACTOR obligation to always be ready to attend to changes in intervention for the drilling rig to which a service front has been allocated, as well as conditions to attend to another rig or operation after the wellhead interventions of a given front have ceased.


9.4.1 PETROBRAS will inform the CONTRACTOR of the preferred scopes that must be met for the service front.

9.4.2 The maximum period for dealing with changes to the intervention date, plus the additional period strictly for moving materials (item 8.1) necessary for the provision of services (change of drilling rig or well on one front):

9.4.2.1 Within the scope of the service front, the deadline for responding to changes is up to 7 (seven) calendar days.

9.4.2.2 Outside the initial scope of the service front, the deadline for responding to changes is up to 15 (fifteen) calendar days.



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9.4.3 New operations that become necessary (new drilling rigs), on a one-off basis, mobilizing tools from service fronts that have already been activated for other drilling rigs, will imply a service deadline of 3 (three) running weeks.

9.5 The minimum quantity of tools per additional front is understood to be that which is minimally necessary to carry out the operation on the drilling rig that is related to the front, disregarding any additions to circumvent maintenance, logistical and scheduling uncertainties, as well as contingencies (which must be statistically evaluated), and may result in fractional numbers.

9.6 Critical wellhead operations must have a *back-up* tool to safeguard operational continuity. These operations are:

9.6.1 BOP pressure test, including the blind ram test, isolating the wellhead from the casing.

NOTE: The CONTRACTOR must provide a tool for testing the BOP with or without the wear bush installed in the CABP, or after the installation of the additional locking device, if necessary.

9.6.2 Installation (combo) and recovery of casing hanger and *pickoff*.


9.6.3 Installation and recovery of bushings in dedicated or coupled maneuvers.

9.6.4 Installation of casing hangers.

9.6.5 Installation of housings.

9.7 The CONTRACTOR shall evaluate the need to provide a *back-up* of the tools described in item 9.6. The *backups* must also be ready and maintained.

9.8 The CONTRACTOR shall submit a weekly list to PETROBRAS containing information on the availability of tools and equipment at the service front.

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9.9 A container with hand tools (pliers, calipers, etc.), supplies, shackles, eyebolts, torque wrenches and any other small accessory required for the contractual operations must be allocated to each service front (operational unit). The CONTRACTOR is responsible for the maintenance and replacement of hand tools and supplies.

## 10 EXTRAORDINARY ENGINEERING SERVICES

10.1 The CONTRACTOR shall provide technical engineering assistance (engineering services) to analyze the products by issuing reports, technical drawings or reports directly related to the equipment and supplies required for installation.

10.2 Extraordinary means the information gathering not contained in manuals or data books and that the need for this information does not derive from anomalies arising from the use of the products and services for which the CONTRACTOR is responsible.

10.3 Hardware and software resources, as well as bibliographic sources and engineering files are the responsibility of the CONTRACTOR.

10.3.1 The software must have resources for analyzing solids, predicting static, quasi-static, dynamic and thermomechanical phenomena, and must be able to consider contact, friction and non-linear nodal displacement/deformation factors.


10.3.2 The CONTRACTOR must have hardware with adequate performance for the analyses demanded by PETROBRAS.

10.4 This is the scope of the service:

10.4.1 Finite element modeling and analysis of wellhead equipment or tools to study stresses, displacements, tensions or various deformations.

10.4.2 *Stack-up* analyses, or geometric compatibility of equipment and tools.

10.4.3 Technical information on aspects, characteristics or functionalities of the tools or equipment not contained in the manual or data book or which require more in-depth treatment.

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## 11 TREATMENT OF ANOMALIES.

11.1 The CONTRACTOR shall keep PETROBRAS representatives informed of any abnormalities detected during the maintenance of the materials and of any abnormalities or unusual situations that compromise the agreed deadlines, both for the contracted service fronts and for maintenance services.

11.2 Any and all operational failures must result in the CONTRACTOR generating a Failure Investigation Report (RAF), in addition to the anomaly report (RA) typically completed by the *offshore* operator, which is an input for the previous one, comprising a detailed investigation of the anomaly and the application of effective actions to prevent the problems from reoccurring. It must be filled in using the system indicated by PETROBRAS.


11.2.1 The CONTRACTOR shall send the Anomaly Report (AR) to PETROBRAS within a maximum of 48 hours.

11.3 The result of the investigation (RAF) must contain a report concluding the causes of the anomaly signed by the maintenance supervisor, operational supervisor and Product Engineering manager of the CONTRACTOR, duly validated by PETROBRAS, and must be delivered to the Contract supervisor.

11.4 The deadline for completion of the investigation through delivery of the RAF duly validated by PETROBRAS is 30 (thirty) calendar days from the arrival of the equipment/tool at the CONTRACTOR base. The deadline may be extended by up to the same period at the CONTRACTOR request, subject to technical justification based on the complexity of the investigation.

11.4.1 Depending on the anomalies that the CONTRACTOR equipment presents, and if necessary, and at the request of PETROBRAS, the CONTRACTOR shall carry out and present detailed engineering studies, which may or may not require computer simulations and tests.

11.4.2 The engineering studies may be accompanied by PETROBRAS representatives and must be approved by PETROBRAS.

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11.4.3 In the case of monitoring tests abroad, the CONTRACTOR must notify PETROBRAS at least 6 weeks in advance.

11.4.4 The CONTRACTOR must provide technical information relating to this contract and the execution of the equipment and tools services to the technical body designated by PETROBRAS. If any information is considered confidential, it must be treated in accordance with the confidentiality clauses of the contract to be signed.

11.5 In the event of an operational failure, or any occurrence associated with human error (willful misconduct, malpractice or failure to follow procedure), in which case, according to the opinion of PETROBRAS technical staff, if necessary, the CONTRACTOR will not be entitled to payment for the period during which the anomaly occurred, equivalent to the lost time generated. In this case, there will be pro rata payment, as well as the application of a compensatory fine.

11.5.1 The period to be taken into account in the event of an anomaly causing lost time in operations will be based on the Drilling Rig Inspector's record of occurrences in the progress of the well's construction. In these cases, the following factor must be multiplied to the value of the service PPU line corresponding to the activity:

$$F = (TT - TP) / TT$$

Where:

F = Pro rata payment factor;


TT = Total operation time (useful + lost);

TP = Lost time associated with the anomaly;

NOTE 1: The total time starts when the tool is connected for well lowering and ends when the tool is disconnected after successful operation.

NOTE 2: The time lost will be recorded according to the notes made by the drilling rig inspector.

11.6 It is the CONTRACTOR duty to improve the equipment and tools in order to correct the causes of the faults identified in the anomaly investigation report.

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11.7 The CONTRACTOR shall be subject to a contractual fine if the treatment of the anomaly does not meet the deadline agreed with the PETROBRAS technical team for delivery of the solution.

## **12 STORAGE AND PACKAGING IN CONTAINERS**

12.1 The containers will be used to transport bushings, various seals (in accordance with the approved operations program), inclination meters (if applicable) and other small items, which must be permanently packed throughout the CONTRACTOR work on the drilling rig on the service front.

12.2 At the CONTRACTOR discretion, the containers may also unify all the hand tool boxes for a service front.

12.3 The containers must have adequate dimensions and compartments for organizing the materials.

12.4 The containers must be identified by stickers or have painted and visible identification on their sides containing: the CONTRACTOR logo, the identified drilling rig and the activity ("wellhead") for which it is intended.

12.5 The CONTRACTOR is responsible for supplying and certifying equipment and tool lifting sling in accordance with current and up-to-date standards.

12.5.1 The CONTRACTOR is responsible for managing the certification period of the lifting slings and must arrange for their replacement, taking into account expiry dates, logistical deadlines and operational continuity.

12.5.2 The CONTRACTOR is responsible for replacing the lifting slings if they fail certification or if repair is no longer feasible.

12.5.3 The CONTRACTOR may not release any equipment, including slings, with an expiration date of less than 3 (three) months.