Decommissioning Regulatory Framework and Challenges

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1. CONTEXT

2. RESOLUTION Nº 27/2006 UPDATE

3. CHALLENGES
1. CONTEXT
Brazil E&P in Perspective

- Proven reserves: circa 12,8 billion barrels of oil and 369 billion m³ of NG
- Production: 3,3 million bbl/day of equivalent oil (~52% from pre-salt fields)
- 9 bidding rounds in the last 3 years
- 6th Production Sharing Bidding Round (pre-salt) in November 2019
- At least four bidding rounds planned for the next 2 years
- 158 offshore production units, 24 offshore drilling rigs, almost 18 new production units up to 2022
- 41% of offshore production units are more than 25 years of use – considerable decommissioning scenario for the next 5 years
Offshore Decommissioning Scenario

Aging platforms / sedimentary basins

<table>
<thead>
<tr>
<th>Age</th>
<th>Sergipe / Alagoas</th>
<th>Campos</th>
<th>Potiguar</th>
<th>Ceará / Espírito Santo / Camamu-Almada</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;25 years</td>
<td>22</td>
<td>21</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>15 – 25 years</td>
<td>2</td>
<td>13</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>&lt;15 years</td>
<td>2</td>
<td>29</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>12</td>
<td>3</td>
<td>26</td>
</tr>
</tbody>
</table>

Legend:
- Green: >= 25 years
- Yellow: 15 – 25 years
- Orange: < 15 years

Total aging platforms: 66
Total aging basins: 23
Regulation objectives

1. Maximize reservoir recovery and prevent premature decommissioning
   Decommissioning Justification Study

2. Promote business between future and current operators, developing new markets
   Use of existing facilities (private trading instrument)

3. Enhance regulatory predictability and simplification
   One PDI submitted to the Maritime Authority, IBAMA and ANP
2. RESOLUTION ANP Nº 27/2006 UPDATE (OFFSHORE)
The present decommissioning regulation

ANP Resolution No. 27/2006, up to now prevailing, establishes the internationally accepted guidelines and practices for deactivation of oil production facilities.

ANP is revising this regulation to modernize and align Brazilian norm with international regulations and best practices in the oil and natural gas industry.

The revision of ANP Resolution No. 27/2006 will present new obligations to operators. Such obligations could be met through innovative technical solutions, engineering studies, risk analysis and socio-environmental assessments, inspection and monitoring services and waste management.
Additional Decommissioning Rules

Resolution ANP nº 43/2007
Establishes the Operational Safety Management System (SGSO) for offshore production and drilling units.

Resolution ANP nº 41/2015
Establishes the Subsea Safety Management System (SGSS).

Resolution ANP nº 46/2016
Establishes the Well Integrity Management System (SGIP).

- Guarantee the asset integrity management during all asset lifecycle
- Decommissioning must be based on risk analysis and management
- Inspections and maintenance plans must be implemented during all asset lifecycle
Resolution ANP nº 27/2006
New regulation flowchart

Decommissioning Program
(preliminary, with comparative assessment, inventory & costs)
Justification Study

180d

Approval

Decommissioning Program
(Studies and final project)

180d

Approval

Decommissioning Report

End of decommissioning

End of contract

- 3.5yrs

Bidding process

Agreement between parties
(facilities to be decommissioned)

- 5yrs

Operations transfer

Production and complementary development

New contract signature
Some improvements

- Comparative assessment (safety, environmental, financial, social, etc.) as a decision-making tool
- Clear definition of the minimum content for the decommissioning program
- Non-prescriptive regulation, with the objective of creation of an environment for development of decommissioning best practices, including risk assessment, pre- and post-decommissioning inspection and monitoring, etc.
- The same decommissioning program must be presented for all regulatory authorities (ANP, IBAMA, Navy)
Some improvements: inspection and monitoring

**Pre - Decommissioning**
- Inspection of subsea installations (inventory and conditions)
- Environmental baseline survey (physical, chemical and biological parameters in water column and sediments)

**Post - Decommissioning**
- Debris survey (post-removal clearance)
- Environmental survey (physical, chemical and biological parameters in water column and sediments)
- Conditions of installations left in place

Resolution ANP nº 27/2006
Revision
3. Challenges
Challenges for decommissioning

- Invasive species (sun coral)
- Large number of subsea installations
- Deep and ultra deep waters
- Waste management, including NORM/TENORM
- ‘Green’ dockyards for dismantling
- Environmentally sensitive areas
- Supply chain, port infrastructure and logistics
National Agency of Petroleum, Natural Gas and Biofuels - ANP

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