BKI ROLE AS CLASSIFICATION SOCIETY IN LNG SUPPLY, TRANSPORT & STORAGE

Rudiyanto

PT. Biro Klasifikasi Indonesia (Persero)
Presentation Content

1. BKI at Glance
2. Offshore Supply Chain
3. Floating Facilities
4. BKI in Supporting Offshore Business
5. BKI Experiences
BKI at Glance

**Scope of Work**

1. **BKI foundation**
2. **Activities**
3. **Supporting**

**Activities**
- Published Technical Standard
  - Regulation, Guideline, Guidance's products for User:
    - Shipyard,
    - Ship owner,
    - supporting industry and technical consultant

**Classification Society**
- Classification Survey & certification services of Ship
  - Seaworthiness Cert. User:
    - Government cq Syahbandar
    - PSC

**Material, Component & shipyard welding shop Certification**
- All of supporting Industries related with Ship operational and ship building construction
BKI at Glance

- BKI was **founded by Mr. Ali Sadikin**, Minister of Transportation in 1st July, 1964.

- By the establishment of **PP No.28/1964** “the foundation of PT. Biro Klasifikasi Indonesia”, the main consideration of its establishment are to:
  - Indonesia is an archipelago country which it has more than 15,000 islands.
  - Until 1964, the government of Indonesia still used the foreign **classification** for both maintenance and regulate new building of ships.
  - In some condition, the **foreign rules were not suitable for Indonesian sea water territory**.
  - National Proud of having own **classification** and giving a chance for Indonesian Engineers.
BKI at Glance

BKI foundation ➔ Scope of Work ➔ Activities ➔ Supporting

As Classification Society

Marine Research and Development

Recognize Organization (RO) for Indonesian Statutory

Inspection and Certification Company (Migas, Minerba, EBTKE, Naker)

Offshore: Oil and Gas Business

Public Training of IMO and Statutory Matter

Marine Engineering Services

Industrial Engineering Services

Testing and Laboratory Services
BKI at Glance

BKI foundation ➔ Scope of Work ➔ Activities ➔ Supporting

Drawing Approval & Survey Activities

<table>
<thead>
<tr>
<th>Year</th>
<th>Drawing Approval</th>
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Register Class BKI

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<th>December 2012</th>
<th>Up to May 2014</th>
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<tr>
<td></td>
<td>Unit</td>
<td>GRT</td>
<td>Unit</td>
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Sources: BKI internal Register up to May 2014
Total Branch Offices: 21
International Branch: Singapore &
In Progress for China (Shanghai) Office

For world wide survey BKI either can carry out survey by BKI surveyor or asking other societies which have a mutual representative (IACS members) for doing survey on behalf of BKI.
Offshore Supply Chain

Int. Chain ➔ Scope of Work ➔ Activities ➔ Supporting

4th LNG Supply, Transport & Storage

References: https://www.unionfenosagas.com
Offshore Supply Chain

Int. Chain ⟷ LNG In Indonesia ⟷ Offshore chain ⟷ Offshore Facilities

Mini LNG Seminar, SKKMigas

4th LNG Supply, Transport & Storage
Currently Indonesia has many uneven distribution of gas reserves that do not match with the regional demand – creating the urgent need for infrastructure.
**Offshore Supply Chain**

**Classification of FLNG Terminal:**
- Hull & Machinery System
- Top side Process (Optional)
- Mooring System & Equipment
- BKI Part 5 Volume 2, Guidelines for FLGT Terminals

**Classification of LNG Carriers:**
- Hull & Machinery System
- BKI Part 1 Volume II, Volume III & Volume IX

**Classification of FSRU Terminal:**
- Hull & Machinery System
- Top side Process (Optional)
- Mooring & System Equipment
- BKI Part 5 Volume 2, Guidelines for FLGT Terminals

**Gas Transport:**
- CNG Carrier
- Conversion Fuel to CNG
- Mini LNG
- etc

**Fixed Offshore Transport:**
- Jacket
- Platform
- TLP
- BKI Part 5 Volume I, II, VII

**Offshore chain**

**Prod, Liq & Storage**

**Shipping**

**Industry**

**Transport**

**Others**
## Offshore Supply Chain

### Operator
- **Project**: Prelude
- **First Gas**: 2017
- **Water Depth**: 250m
- **Production of LNG**: 3.6mtpa
- **Hull size**: 488m x 74m
- **LNG Storage**: 220km³
- **Tank System**: Mark II/NO96 (2-row)
- **Mooring System**: Internal turret
- **LNG Offloading**: side by side
- **Liquefaction System**: DMR
- **Classification**: ABS
- **Progress**: FEED Phase

### INPEX
- **Project**: Masela (Abadi)
- **First Gas**: 2016
- **Water Depth**: 300m
- **Production of LNG**: 2.5mtpa
- **Hull size**: * 320m x 60m
- **LNG Storage**: 170 - 185km³
- **Tank System**: SPB
- **Mooring System**: External turret
- **LNG Offloading**: side by side
- **Liquefaction System**: DMR*
- **Classification**: BKI/ABS
- **Progress**: Pre-FEED

### FLEX
- **Project**: Uncertain (the site proposed: Timor Sea, Nigeria, PNG)
- **First Gas**: Uncertain
- **Water Depth**: Uncertain
- **Production of LNG**: 1.7 - 2mtpa
- **Hull size**: 320m x 60m
- **LNG Storage**: 180km³
- **Tank System**: SPB
- **Mooring System**: External turret
- **LNG Offloading**: side by side
- **Liquefaction System**: Dual N2 expander
- **Classification**: undecided
- **Progress**: Pre-FEED

### BW Offshore
- **Project**: Uncertain
- **First Gas**: Uncertain
- **Water Depth**: Uncertain
- **Production of LNG**: 2mtpa
- **Hull size**: 370m x 60m
- **LNG Storage**: 180km³
- **Tank System**: MOSS
- **Mooring System**: External Turret
- **LNG Offloading**: side by side
- **Liquefaction System**: Linde Multi-MR
- **Classification**: undecided
- **Progress**: Pre-FEED

### SBM
- **Project**: Uncertain
- **First Gas**: Uncertain
- **Water Depth**: Uncertain
- **Production of LNG**: 2.5mtpa
- **Hull size**: 320m x 60m
- **LNG Storage**: 180km³
- **Tank System**: SPB
- **Mooring System**: Internal turret
- **LNG Offloading**: undecided (tandem under testing)
- **Liquefaction System**: Niche LNG (N2/CH4 expander)
- **Classification**: undecided
- **Progress**: Pre-FEED

### Hoegh
- **Project**: Uncertain
- **First Gas**: Uncertain
- **Water Depth**: Uncertain
- **Production of LNG**: 2-3mtpa
- **Hull size**: 380m x 60m
- **LNG Storage**: 190km³
- **Tank System**: NO96 (2-row)
- **Mooring System**: Internal turret
- **LNG Offloading**: side by side
- **Liquefaction System**: DMR
- **Classification**: undecided
- **Progress**: Pre-FEED

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*Note: * denotes uncertain values.*
Offshore Supply Chain

Int. Chain → LNG In Indonesia → Offshore chain → Offshore Facilities

Floating Production Unit (FPU)

Floating, Storage and Off-loading

FSO

FPU

MODU/ MOPU

Floating, Production, Storage and Off-loading

FPSO

Others

Floating, Storage, Regasification Unit

FSRU

FLNG, Rig, Platform, etc.

Mobile Offshore Drilling/Production, Unit

Other
BKI in Supporting Offshore

BKI Offshore Division as special division for supporting offshore business detached from BKI Class division as a new unit in 26th April 2013. The expected of achievement are:

- **Simplify the Process**
  Taking the offshore and floating facility in a special unit will be simplify the process with a single gate

- **SLA (Service Level Agreements)**
  Increasing the service level to stake holder in the offshore, oil and gas company.

- **Meet PSC Expectation**
  Expectation of PSC that BKI would increase the capability and also professionalism for the activities in the surveys, classification, and inspection

- **Diversification of Business**
  Business of Oil and Gas is promising business for the diversification of BKI Business, and taking a challenge to focus on this business will develop brand of BKI
BKl in Supporting Offshore

Rules, Guideline and Instruction Procedure

- Part 5, Volume IX Rules for Single Point Mooring
- Part 5, Volume XII Rules for Facilities on Offshore Installation
- Part 5, Volume 2, Guidelines for Floating Offshore Liquefied Gas Terminals
- Part 5, Volume 3, Guidelines for Floating Production Installations
- Part 7, Volume 1, Guidelines for Certification of Lifting Appliances
- Part 7, Volume 2, Guidelines for Dynamic Loading Approach
- Part 7, Volume 3, Guidelines for Spectral-Based Fatigue Analysis
- Part 7, A. Guidance for The Class Notation Helicopter Deck and Facilities (HELIL 7 HELIL(SRF))
- Part 7, B. Guidance for Crew Habitability on Ship
- Part 7, C. Guidance for Crew Habitability on Offshore Installation
- Part 7, D. Guidance for Hull Inspection and Maintenance Program
- Part 7, E. Guidance for Planed Maintenance Program
- Part 7, F. Guidance for the Environmental Service System for ships and Offshore Units Floating Installations and Lifeboat
- Part 7, G. Guidance or the Performance Standards
- Part 7, H. Guidance for The Class Notation Emergency Response Service (ERS)
## Software List

<table>
<thead>
<tr>
<th>No</th>
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<tbody>
<tr>
<td>1</td>
<td>GLFrame</td>
<td>Ship &amp; Contraction Scantling Review</td>
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<td>2</td>
<td>Poseidon</td>
<td>Construction Stress Analysis</td>
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<tr>
<td>3</td>
<td>GL Rules</td>
<td>Ship &amp; Contraction Scantling Review</td>
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<tr>
<td>4</td>
<td>Sea Trust</td>
<td>Construction Stress Analysis for Common Structural Rules (CSR)</td>
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<td>5</td>
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<td>6</td>
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<td>8</td>
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<td>Hydrodynamic and Ship Stability Analysis</td>
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<td>12</td>
<td>Autocad</td>
<td>Ship Design Drawing Approval</td>
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</table>
BKI in Supporting Offshore

IACS stand for International Association of Classification Society
This flow chart indicate the steps that have been taken by BKI in order to get the International recognition from IACS, then can be audit as become member of IACS

Phase I:
• Verification BKI as Class Society;

Coverage Service
Description for an excellence services covering world wide coverage

Record Document
There is documents filing up to 10 years of registry

Class & Statutory
Ability in conducting class survey and statutory matter based on int. standard

Own Rule
Ability to develops own rules for classification and Development of R&D

Government Support

Road To IACS

Facility & Technical Support

Background

4th LNG Supply, Transport & Storage
BKI in Supporting Offshore

**Background**

**Facility & Technical Support**

**Road To IACS**

**Government Support**

### Cabotage

**UU No. 17 Tahun 2008, Tentang Pelayaran**

Stated about Sea transportation and operation

### Local Content

**Permen ESDM No.15 Tahun 2013, Tentang Penggunaan Produk Dalam Negeri pada Kegiatan Usaha Hulu Minyak dan Gas Bumi, Stated Minimum Requirement of Local Content**

### Obligation to Classification

**PM 07 tahun 2013, Tentang Kewajiban Klasifikasi Kapal Berbendera Indonesia kepada Badan Klasifikasi, Stated Obligation of all ship that operated in Indonesia Sea water to classes to National Classification or dual with IACS members**
BKI Experiences

BKI Experiences

FPSO/FSO

FPU/ LNG Carrier

FLNG/GSRU

Ladinda Life Extension Project

West Madura Offshore FSO Swapping Project

Terang Sirasun Batur Development Project

Multi Echo FSO

Federal I & II FSO

ENI FPU Jangkrik

Gendalo & Gehem FPU

Bukit Tua Development Project

Abadi Gas Field Development Project

Banyu Urip Development Project

Arco Arjuna FSO
RCL Natuna FPSO
Raisis FSO
Lentera Bangsa FSO
Kakap Natuna FSO

4th LNG Supply, Transport & Storage
BKI Experiences

**FSO Aberkhah**
- **Operator**: Pertamina PHE WMO
- **Capacity**: 81183 MT
- **LoA**: 242.9 m
- **Class**: BKI-NK
- **Status**: In operation
- **BKI Class Notation**: ± A100 "FSO" Moored at West Madura Offshore Poleng.

**FPSO Ratu Nusantara**
- **KKKS**: PETRONAS
- **Field Life Design**: 10 Years
- **Class**: BKI-ABS
- **Status**: Construction Stage
- **BKI Class Notation**: ± A100 FLOATING STORAGE AND OFFLOADING SYSTEM (SHIP TYPE), CL(100), RFL(10), 2024 IN BUKIT TUA FIELD, KETAPANG BLOCK OFFSHORE MADURA, IW
**BKI Experiences**

**PLN CNG Carrier**
- **Operator**: PT. PLN (Persero)
- **Capacity**: 23.38 mmscf
- **LoA**: 106.5 m
- **Class**: BKI- IACS
- **Status**: Pre-Construction Stage
- **BKI Class Notation**: ✽A100 CNG Carrier ✽SM DF-CNG
- **Voyage Notation**: Unrestricted

**LNG Carrier**
- **Operator**: PT. TRADA MARITIME, TBK
- **Capacity**: 126350 m³
- **LoA**: 273.4 m
- **Class**: BKI - ABS
- **Status**: In operation
- **BKI Class Notation**: +- A100 (I) "LIQUEFIED GAS CARRIER", TYPE 2G
## BKI Experiences

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
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<tr>
<td><strong>Operator</strong></td>
<td>PT. PGN (Persero)</td>
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<tr>
<td><strong>Storage Volume</strong></td>
<td>-</td>
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<tr>
<td><strong>LoA</strong></td>
<td>294 m</td>
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<td><strong>Class</strong></td>
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<tr>
<td><strong>Status</strong></td>
<td>Commissioning Stage</td>
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<tr>
<td><strong>BKI Class Notation</strong></td>
<td><img src="image1" alt="BKI Class Notation" /></td>
</tr>
</tbody>
</table>

### FSRU West Java

- **Operator**: PT. Nusantara Regas
- **Capacity**: 125000 m³
- **LoA**: 293.74 m
- **Class**: BKI-ABS
- **Status**: In operation

**BKI Class Notation:**

- A100 Offshore Liquefaction Gas Terminal F(LNG) RSO, IW, RFD(F40)

### FSRU Lampung

- **Operator**: PT. PGN (Persero)
- **Storage Volume**: -
- **LoA**: 294 m
- **Class**: BKI-DNV
- **Status**: Commissioning Stage

**BKI Class Notation:**

- A100 Liquefied Gas Carrier (LNG)R, Ship Type 2G (-163,500 kg/m³, 25kpa), NAV-OC, EP+, RSD(F40), CPS, IW, SPM, SM, GF, OT, CM-PS
BKI Experiences

INPEX FLNG Masela Project
KKKS : Inpex Masela Ltd.
FLNG : tba
Field Life Design : 30th
Class : BKI-ABS
Status : FEED Stage
BKI involved in GAP Analysis, Pre-FEED, and FEED Stage
BKI Class Notation:
+ A100 Offshore Liquefied Gas Terminal
F(LNG)PLSO, IW, DYLA(S200) Abadi Field, SFA(30), OHCM, + A-SM, OT, PMP, HBT, CPS, LA, RCM (FF, CARGO), EP-OS, HELIL (SRF), HIMP, ERS, RSD(ACM), DP 1 (SoF: Statement of Fact).
BKI Experiences

**MODU Boss 1**

**Operator**: Pertamina PHE WMO  
**Capacity**: -  
**LoA**: -  
**Class**: BKI-BV  
**Status**: In operation  
**BKI Class Notation**: +A100 “Offshore Self Elevating Unit Production, PHE-38, Madura

**ENI FPU Jangkrik**

**Operator**: ENI Muara Bakau  
**Capacity**: -  
**LoA**: 200 m  
**Class**: BKI-DNVGL  
**Status**: Pre-Construction Stage  
**BKI Class Notation**: ✣A100 Floating Offshore Installation, DYLA(S100), FL, in Jangkrik Field, IW, ✣A-SM
Thank you