

Germanischer Lloyd



## Sea Power 2012 – Classification of Submarines with GL

2012-08-29

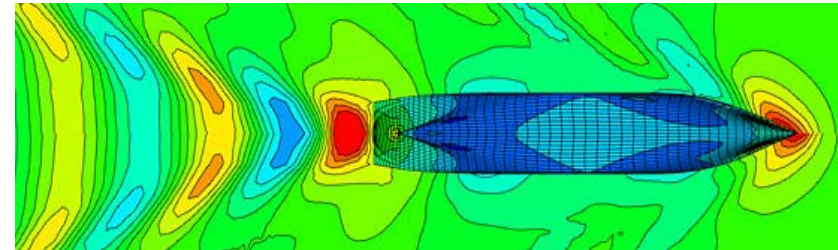


- 1. GL- Your Naval Partner**
- 2. Classification of Submarines**
- 3. Selected References**

# Germanischer Lloyd

Your Partner Worldwide

- 1867 founded in Hamburg as the German Classification Society
- Today more than 6,000 employees in 80 countries
- More than 200 stations worldwide for our customer's support
- GL – Maritime Services
  - Classification
  - Maritime Solutions / Future Ship
  - Research and Development
- GL – Industrial Services
  - Oil & Gas
  - Renewables

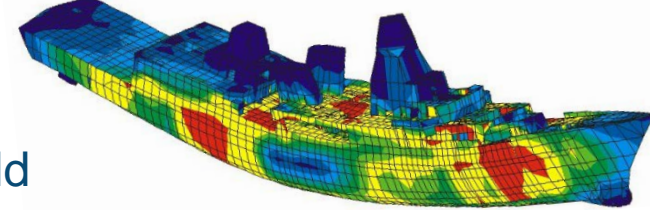


# Germanischer Lloyd

Your Naval Partner



- 1970 Entry into the naval business with the classification of the German Navy submarine „Wilhelm Bauer“
- Relationship to more than 50 navies in the world
- 1st classification of naval surface vessels in the world
- 1st classification of naval subsurface vessels in the world
- More than 100 German Navy Ships were constructed and built in accordance to GL Rules
- More than 40 naval ships are maintained and supervised in GL class



# Germanischer Lloyd

Your Naval Partner

- Member of NSCA (Naval Ship Classification Association – Naval IACS)
- Member of INSA (International Naval Safety Association – Naval IMO)
- More than 200 GL-Stations in 74 countries
- Naval projects in more than 30 countries in the last 40 years



1. **GL- Your Naval Partner**
2. **Classification of Submarines**
3. **Selected References**

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## Classification of Submarines

Submarine Projects are handled by special personnel:

experienced submariners (res/ret), officers (res/ret), engineers with experience from construction (e.g. IKL), welding specialists for high tensile steel, etc

All personnel involved has appropriate security clearance

Deployment:

- Navy Group, Head Office Hamburg  
(PM, co-ordination)
- Department Pressure & Underwater Technology, Head Office Hamburg  
(plan approval, worldwide surveys and deployments upon request)
- Special Surveyors for submarines/submarine components at stations in  
Kiel, Hamburg, Augsburg, Cape Town and others



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## Classification of Submarines

### I Ship Technology

#### 0 Classification and Surveys

#### 1 Seagoing Ships

#### 5 Underwater technology

### II Materials and Welding

#### 1 Metallic Materials

#### 3 Welding

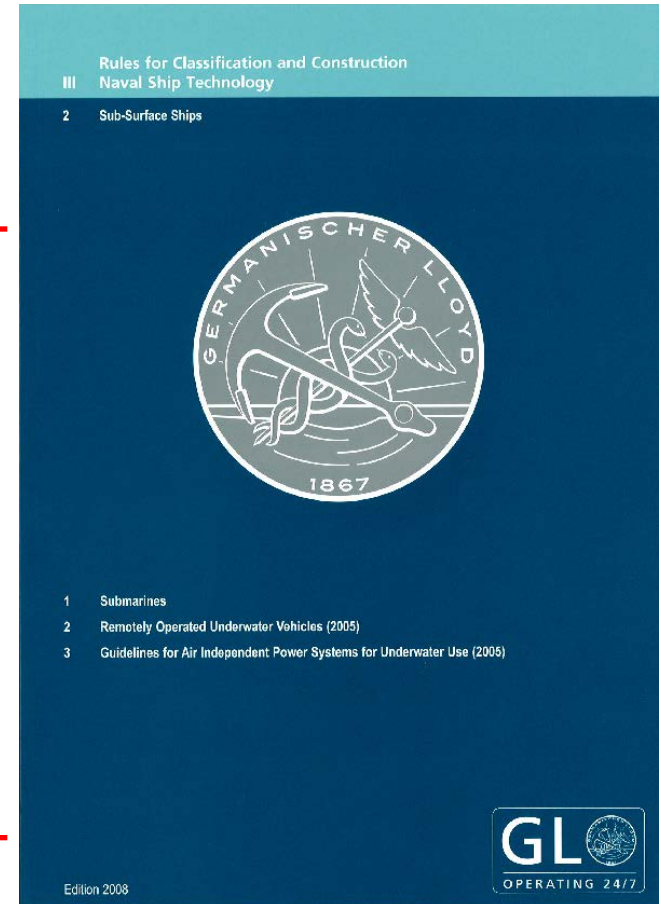
#### 6 Special Materials for Naval Ships

### III Naval Ship Technology

#### 0 Classification and Surveys

#### 1 Surface Ships

#### 2 Sub-Surface Ships



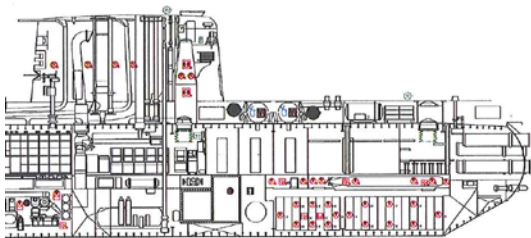


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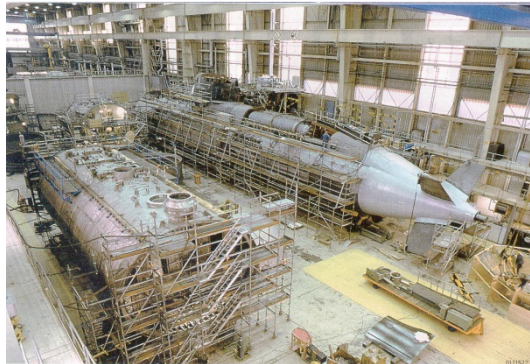
## Classification of Submarines



Design- and Construction Phase



Building Phase



Operating Phase



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## Classification of Submarines – Selected References

### South African Navy

HDW Submarine Type 209 Heroine Class

+ **100N6 Submarine**

+ **MC U**

GL Performances:

- Classification
- Technical Support

Reasons for Classification:

- Independence from building yard
- Lack of own technical staff



First Naval Submarines classified and operating under the technical supervision of GL.

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## Classification of Submarines – Selected References

### HDW Submarines

- U205/U206 German Navy
- 2 Submarines for Argentina
- 6 Submarines for the RNoN
- “Dolphin” class
- U214 South Korean Navy
- U212 German Navy
- U214 Hellenic Navy



### GL Performances:

Testing and inspection of materials, components, systems and equipment according to GL Rules for Classification and Construction and Building Specification

### Examples:

- GL certified steel, e.g. HY 80 / HY 100 incl. WPS
- LOX and hydrogen tank systems in AIP scheme
- construction supervision and R&D supervision for FC system (AIP),
- Weapon transport and stowage system
- Rescue system

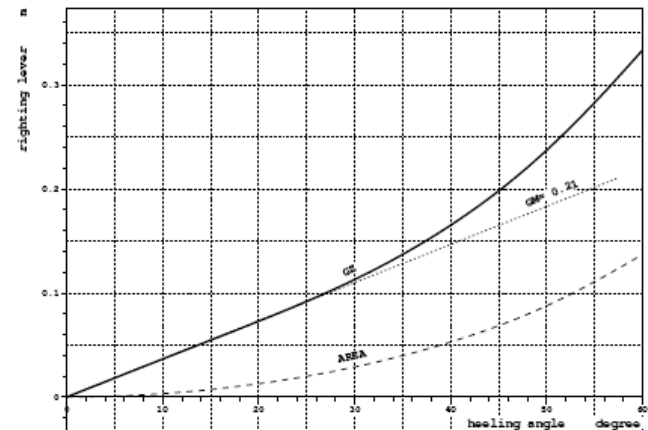
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## Classification of Submarines – Selected References

### Technical Support (Operating Phase)

#### Examples:

- Inspection and determination of measures for repair after collision  
here: cracked stringer in the main ballast tank
- Stability calculation during maintenance  
here: battery removal

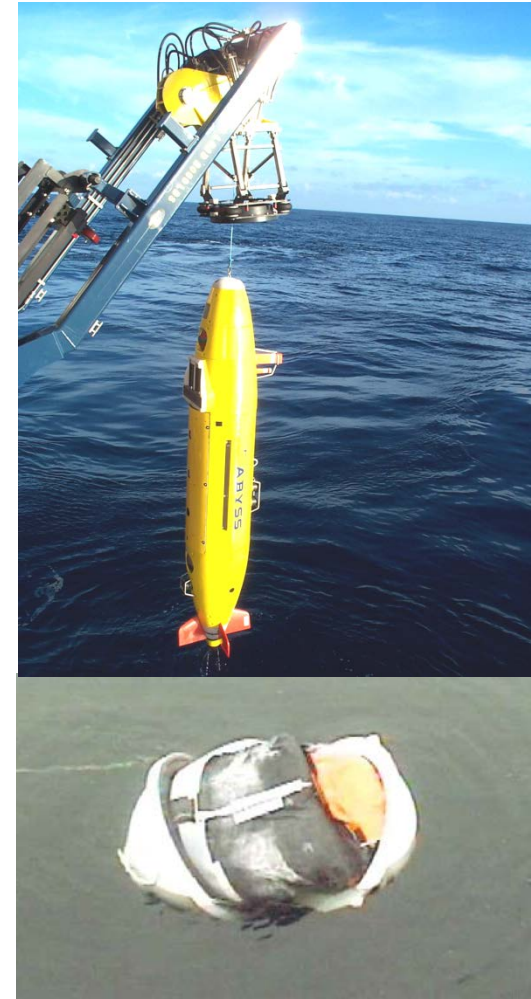


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## Classification of Submarines – Selected References

### Further experience (Submarine related)

- Several 6000m projects
- Diving simulators
- Integrated onboard diving system  
incl. onshore training facility
- Mission equipment
- Rescue equipment
- Life support







Thank you for your kind attention!