

**PIANC Workshop**  
**13-14th September 2011**



**IDENTIFICATION OF THE CHALLENGES  
FOR TOMORROW**

**PIANC Panel Group**  
**LOCKS EXPERTS**

**PIANC**  
Setting the course



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OF THE CHALLENGES  
FOR TOMORROW**

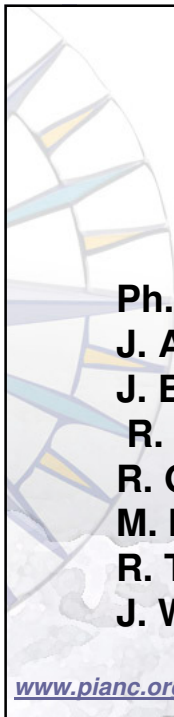


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Innovations  
in  
navigation  
lock  
design

**IDENTIFICATION  
OF THE  
CHALLENGES  
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**GOAL: Identify the pending issues, which remain in 2011 key challenges for the design of navigation locks.**

**The PIANC experts will highlight**

**→ the relevant topics**

- requiring more extensive researches,**
- relevant for new PIANC working groups.**

## CHALLENGES OF TOMORROW



### Identify key issues to consider for the NEXT PIANC WORKSHOP - 2013

Based on experiences gained in projects  
as

- PANAMA, Seine Nord Europe (Fr)
- ANTWERP (Sea lock)
- LYS River and MEUSE river (BE)
- IJMUIDEN (NL, Amsterdam)
- China, Germany, US,....

## 1- IDENTIFICATION OF THE CHALLENGES FOR TOMORROW



- The seismic effect, which is currently investigated by PIANC WG151,
- Ship entrance/maneuvering and ship behavior in locks, which is currently investigated by PIANC WG155,
- Ship impact on lock gates, which is currently investigated by PIANC WG151,
- Reliable design and operation of miter gates, which will be investigated by a new PIANC WG 154,

## 1- IDENTIFICATION OF THE CHALLENGES FOR TOMORROW



- Use of composite material for the design of locks,
- Design of monolith lock (versus a structure with joints),
- High rise navigation locks (above 40 m),
- Water management (lack of or too much),
- Salt water intrusion,

## 1- IDENTIFICATION OF THE CHALLENGES FOR TOMORROW



- Life cycle cost: “Design for Maintenance”,
- Durability of structures,
- Maintainability of equipment and structures,
- Environmental and social aspects,
- Stakeholders’ management,
- Etc.

## 2- CHALLENGES FOR LOCK GATES



- **Reliability under all conditions.** Sometimes engineers complicate their systems too much, increasing in fact the probability of failures.
- **Service life (durability and maintainability) of gate components like tracks, wheels, hinges, seals, buffers and heel posts (mitre gates); and not the main structures that usually serve long enough.**

## 2- CHALLENGES FOR LOCK GATES



- **Maintainability in the sense of: low, easy, safe, healthy and environment-friendly maintenance.**
- **Vessel-friendly service. How to improve the comfort and safety of the vessels and their passengers (crews)?**
- **Etc.**